A CHILTON PUBLICATION

the Iron Age

E NATIONAL METALWORKING WEEKLY

May 8, 1952

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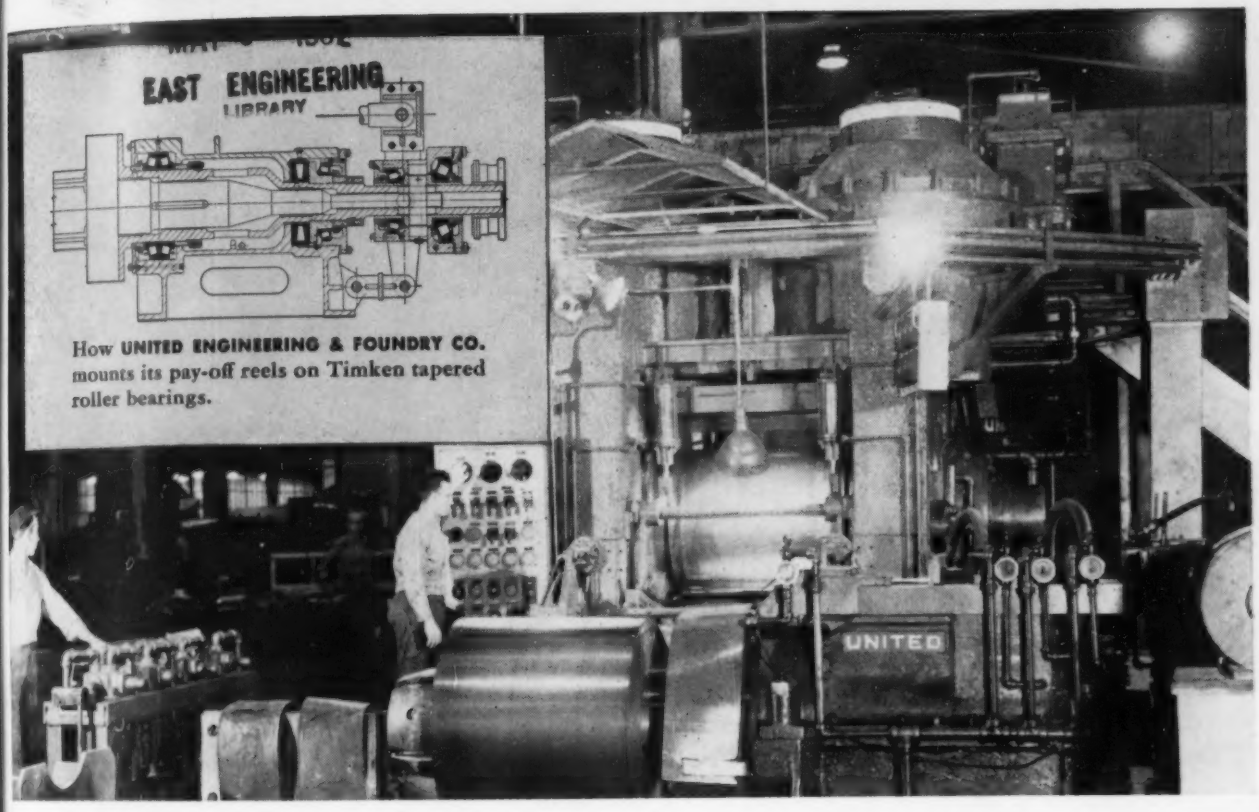


How **UNITED ENGINEERING & FOUNDRY CO.** mounts its pay-off reels on Timken tapered roller bearings.

How TIMKEN® bearings pay off on new pay-off reel

THIS new-design United pay-off reel operates at 5,000 feet per minute. To keep it on the job at this high speed and to take the heavy combination loads involved, design engineers specified that the reel be mounted on Timken® bearings.

Because of line contact between rollers and races, the Timken bearings have extra load-carrying capacity. Their tapered construction enables them to take both thrust and radial loads or any combination. The shaft is held in proper alignment. And because of incredibly smooth surface finish and true rolling motion, friction is practically eliminated. Closures are more effective, too, because the Timken bearings keep housing and shaft concentric. Dirt and grit are kept out, while lubricant is kept in. Danger of fire hazard due to oil leakages eliminated. Maintenance and lubrication time is cut to a minimum.

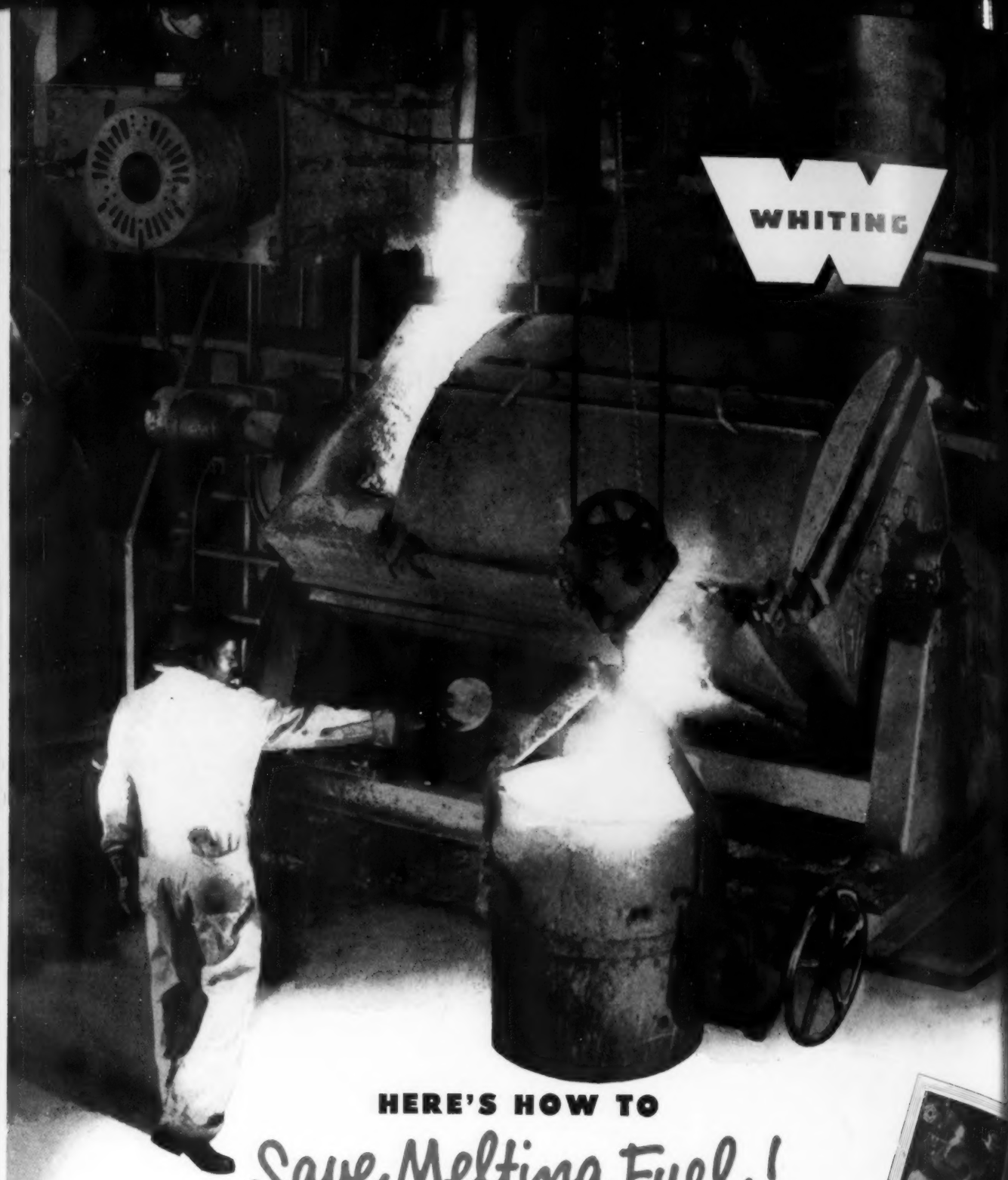
Over 50 years of bearing research and development have made Timken tapered roller bearings first choice throughout industry. Make sure the bearings in the machines you build or buy are stamped with the trademark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN

TRADE-MARKS REG. U.S. PAT. OFF.

TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ⊂ THE TIMKEN TAPERED ROLLER ⊂ BEARING TAKES RADIAL ◐ AND THRUST —◑— LOADS OR ANY COMBINATION



HERE'S HOW TO

Save Melting Fuel!

This new Whiting paper will give you valuable information on one of today's most important subjects. It tells you where to watch for heat losses all the way from melting furnaces to molds—*and what to do about them!* The bulletin is well illustrated and contains charts and diagrams that will interest every foundryman. Ask your Whiting salesman for Bulletin FO-5 or write to:

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FO-1, "How To Make Your Cupola Operation More Efficient"
FO-2, "Tips On Improving Cupola Charging"
FO-3, "Hot-Blast"; FO-4, "Facts On Duplexing"

Tool Steel Topics

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

...e Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

...w the Right Steel Solved ...hese 3 Tool Problems

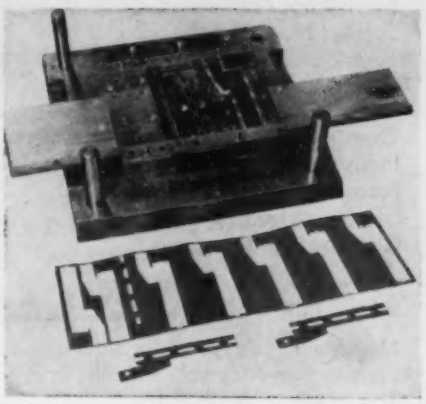
...metallurgical servicemen and distrib... are constantly on the job to help ...s get the most out of their tool steel. ...e are the highlights of some recent ... problems solved by selecting a more ...able steel.

A MAKER OF AUTOMOBILE BUMPERS had been getting poor service from shear blades for trimming hot-rolled spring steel. High-speed steel didn't ...r long enough and the cutting edge ...ged. High-carbon, high-chromium ... steel (our Lehigh H) was tried next. ...ad plenty of wear-resistance, but the ...ing edges developed chipping trouble. **...UTION:** Our man suggested Lehigh L ...high-chromium grade with lower car...). This worked fine — because it had ...cient wear-resistance combined with ...e toughness.

AN AIRCRAFT FIRM WAS BOTHERED by the cracking of some special wrenches for assembling aircraft parts. The wrenches had ...y sharp corners, and both thin and ...k sections. The application called for ...ty of toughness and a fair amount ... wear-resistance. The firm had been ...king these wrenches from a low-carbon ...e of silico-manganese tool steel, and ...y were cracking in the water-quench... operation. **SOLUTION:** We recom...nded Omega. With its less drastic oil-...nch and inherent toughness, it has ...ed the cracking trouble.

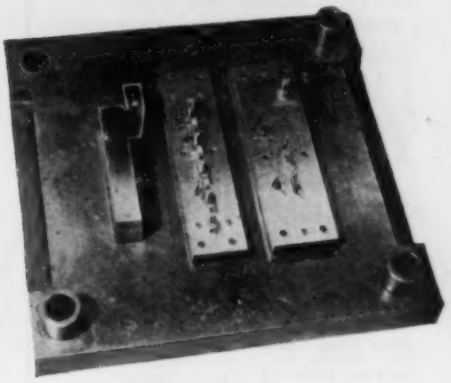
A SHEET-METAL FABRICATOR COMPLAINED to a Bethlehem salesman about the premature breakage of small-diameter punches. Rather long and slender, the punches were used on ...et steel of greater thickness than the ...ch diameter. (It's usually best for the ...ch diameter to be greater than the ...kness of material being punched.) ...e punches were subjected to excessive ...e thrust; constant breakage was run...g up production costs. **SOLUTION:** ...ey tried 67 Chisel, our chrome-tungsten ...de of shock-resisting tool steel. Result: ...nches produced about eight times as ...ny blanks as previously.

Die turns out 500,000 pieces ... and still going strong



This progressive die, made of BTR, performs a perforating, notching, and blanking operation in the production of condenser brackets. This popular grade of oil-hardening steel was selected by the user because it's easy to heat-treat . . . it has good resistance to distortion in heat-treatment and it's easy to machine.

The long-wearing qualities of BTR are evidenced by the production of more than a half-million pieces at the time the photograph was made. Hardened to Rockwell C-59, it produces about 30,000 parts from 3/32-in. steel strip before redressing is needed.



Our Tool Steel Engineer Says:

Rapid wear is caused usually by improper heat-treatment

When tools fail by wearing too rapidly, the trouble can usually be traced to inadequate heat-treatment resulting in decarburized surfaces, improper quenching that produces low hardness, and other faulty procedures.

However, poor wear-resistance may also result from the use of the wrong type of tool steel. If a blanking die is made of a 0.60 pct carbon steel of the shock-resisting type, it can't be expected to wear as long as a 1.50 pct carbon steel having a high chromium content.

NEW USE FOR HIGH-SPEED STEEL

An enterprising apprentice in a tool shop stumbled on a small cache of round steel bars the other day. They were just the right size he needed for a small storage rack the foreman had asked him to build. He made a nice job of it. "This ought to make a hit with the foreman," he thought as the last bar was fitted into place.

When the foreman took one look at the rack, he recoiled in horror. "Oh, no!" he groaned. To the puzzled apprentice the foreman growled, "Young fella, that rack you've got there is worth about ten times the cost of the carbon steel bars it's going to hold. Looks like you've used up every piece of my high-speed steel."

Bethlehem ULTRASONIC TESTED **Tool Steel**

IRON AGE

MAY 8, 1952
VOL. 169, No. 19

CONTENTS

★ **Starred items are digested on opposite page.**

EDITORIAL Mr. Truman's Indifference 7

NEWS OF INDUSTRY

★Special Report: Dictated Steel Settlement Flops 71
★Production: Repeated Steel Shutdowns Costly 73
★Manufacturing: How's Your Inventory? 74
Marketing: Nonferrous Prices In New Shuffle 75
Safety: How About Your Plant? 76
★Financial: Steel Sets Records But Earns Less 77
★Controls: Planners Fight to Keep CMP 78
Defense Contracts 84
Construction Steel News 86
Industrial Briefs 88
Personnel: Iron Age Salutes 105
Iron Age Introduces 107
Clearing House 194

NEWS ANALYSIS

Newsfront 69
★Automotive Assembly Line 90
This Week in Washington 95
West Coast Report 99
★Canadian Comment 101
Machine Tool Highspots 102

TECHNICAL ARTICLES

★Better Design Permits Cheaper Stampings 113
★Get Better Welds With Iron Powder Backup 116
★Quality Control Mandatory On New Air Force Orders 119
Rotary Furnaces Feed Automatic Steel Treating Line 122
Small Press Does Job Of Presses Ten Times Bigger 125
Cores Simplify Machining Of Flash Welded Parts 126
Metal Powder Convention 128
Small Shop Sets Up Production Machining Line 130
Jet Piercer Cuts Holes In Taconite 132

MARKETS & PRICES

★The Iron Age Summary—Steel Outlook 169
Market Briefs 171
Nonferrous Markets 172
Iron and Steel Scrap Markets 176
Iron and Steel Scrap Prices 178
Comparison of Prices 180
Steel Prices 182
Warehouse Prices 185

REGULAR DEPARTMENTS

Dear Editor 9
Fatigue Cracks 11
Conventions and Meetings 12
Free Publications 135
New Equipment 139

INDEX OF ADVERTISERS 206

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CCA — Controlled Circulation Audit

NBP — National Business Publications

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DIGEST

of the week in metalworking

TRUMAN STORMS BUT WAGE MEETING FLOPS

PAGE 71

President Truman summoned union and steel industry leaders to Washington last weekend and sternly told them to settle or else. They chose the "or else" course and the negotiations flopped. The President had done nothing to pave the way. He guaranteed no concrete price rises to industry.

UNION SHUTDOWNS DAMAGE STEEL FURNACES

PAGE 73

On-again-off-again steel industry shutdowns by the steelworkers' union is damaging and shortening the life of blast furnaces, openhearths, coke ovens. This was a big reason why companies wanted no-strike assurances before production was resumed. Maintenance costs will rise very sharply.

STRIKE PROMPTS MASS INVENTORY SURVEY

PAGE 74

Manufacturers across the nation scurried to check their stockpiles of steel when the shutdown hit. The picture was generally optimistic. There was a lot of hidden strength in inventory. An Iron Age survey determined that manufacturers had reserves of from 30 to 45 days—in some cases, 60.

STEEL OUTPUT TOPS, BUT PROFITS SKID

PAGE 77

It was the same sad story on profits for the steel industry in the first quarter of 1952. Output and sales records fell by the wayside but paradoxically profits were 19 pct below the comparable quarter in 1951. Net income pct of sales for U. S. Steel slipped to 5 pct—hard to swallow.

WASHINGTON PLAYS ALARMIST ON CONTROLS

PAGE 78

After the steel shutdown last week had barely started, Washington controls officials were crying the blues about the threat of a serious steel shortage—and, incidentally, the revived need for controls. It was an insight into their desire to retain controls over U. S. industry as long as possible.

DETROIT'S FINANCIAL REPORTS GLOOMY

PAGE 90

Automotive industrialists passed their aspirin bottles to stockholders. In first quarter financial reports it was made painfully evident by them that earnings, sales, and dividends are down. Difficulties cited were controls cutbacks on output, slowness of defense ordering, and sales resistance.

CANADA VIEWS STEEL IMPORTS AS VITAL

PAGE 101

Manufacturers in Canada sweated out the short shutdown last week and were heartened when American steelworkers reopened the industry. Canada fears shorter steel supplies from a long strike. The country is traditionally dependent on the U. S. for one-third its steel. Inventory was checked.

BETTER DESIGN GIVES CHEAPER STAMPINGS

PAGE 113

Don't design a stamping with only the end use in mind. Design it from the point of view of the production process, too. There are many design tricks that can cut stock waste, die cost, and scrap rate. Example: Redesign of a simple lever cut material costs 30 pct and die cost 33 pct.

BETTER WELDS WITH IRON POWDER BACKUP

PAGE 116

Iron powder has been successfully used as backup material for welds on SAE 1015 and 1025 steels. Hardening resulting from rapid heat dissipation is counteracted, and the need for chiseling out and rewelding the root of the seam is eliminated. Powder in sintered bar form gives best results.

QUALITY CONTROL REQUIRED BY AIR FORCE

PAGE 119

It pays to know the Air Force's revised quality control specifications. The revised version can save time and money and cut through red tape. Shop men and engineers get a break on new design work. A legal angle has been settled. Other services may also adopt this Air Force specification.

STEEL CONSUMERS SHRUG OFF OUTPUT LOSS

PAGE 169

Loss of 2.5 million ingot tons of steel output is being shrugged off by steel consumers. Reason: Inventories are much bigger than most observers had thought. Even the certainty of higher steel prices isn't causing any unusual scramble to get "quick" steel. Warehouses report same purchasing trend.

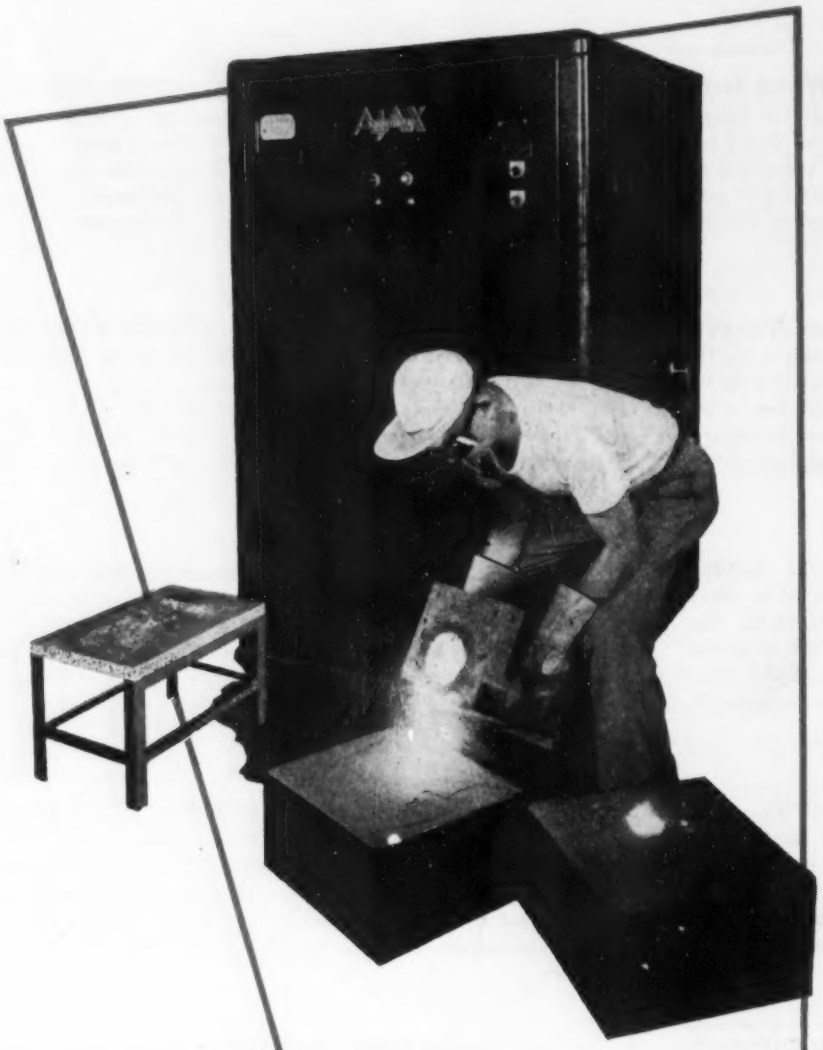
FOUNDRY TACKLES SHELL MOLD PRODUCTION

NEXT WEEK

Shell mold castings of gray and ductile iron have been successfully produced for 6 months in a pilot plant operation of the Lynchburg Foundry Co. Two men handle all work on a specially designed 4-station machine producing the molds. Uniform heating of patterns simplifies stripping of the shells.

Now The Precision and Speed of Induction Melting

. . . FOR MELTS FROM 3 TO 60 POUNDS
. . . FOR MELTS OF ANY METAL



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All the speed and accuracy of induction melting in one compact, efficient 20-kw furnace unit. Easy to operate. Automatic stirring. Self-tuning. No moving parts to wear out, maintenance limited to annual inspection of two electrodes. Also available in 3, 6 and 40-kw sizes. Here are a few typical applications:

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Complete freedom from contamination. Accurate analysis control. Produces melts in minutes instead of hours. Results can be reproduced exactly in large induction furnaces.

PRECISION CASTINGS:
Speed of melting and accurate control of analysis and temperature make this equipment ideal for small-quantity precision casting. Requires little floor space, fits right into production line.

MELTING GOLD, SILVER, PLATINUM, OTHER PRECIOUS METALS:
Because of low losses, freedom from contamination, and high speed of melting, induction furnaces are used in nearly all mints, assay offices and most refineries.

MELTING NON-FERROUS ALLOYS UP TO 60 POUNDS:
Melts 30 pounds of red brass in 22 minutes from cold start. No contamination. Close control. Switch from one alloy to another by simply changing crucibles.

MELTING FERROUS ALLOYS UP TO 30 POUNDS:
No carbon contamination. Melts 17 pounds of steel in 40 minutes from cold start, 30 pounds in an hour and a half.

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138

FOR HEATING AND MELTING

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FOUNDED 1855

Mr. Truman's Indifference

MR. TRUMAN'S meeting last Saturday with steel and labor and his final ultimatum on wages proved his one-sidedness. He had no plans for helping to settle the strike. He threatened both sides when all present knew he would give labor all it wanted and the steel industry much less than it needed.

It seems silly to bring it up but Mr. Truman has known since last November how serious the steel fracas was going to be. Again in January Mr. Wilson filled him in. Sometime later Mr. Wilson again saw him and told him something must be done.

Mr. Truman went through the same periods of indecision in 1946 when 10 million tons of steel were lost due to a strike. Little in the present picture is different from the 1946 episode. It is all running true to form: Support to the hilt for labor and dire warnings to industry.

It was well that the Supreme Court tied Mr. Truman's hands on imposing a wage increase on the steel industry. Had a wage increase been forced on steel the one-sided nature of the action would have been indefensible. He may even do it yet if the Supreme Court should find that he was within legal bounds in taking the power to seize the steel industry.

All through the negotiations and the talk over the steel impasse Mr. Truman has failed to show decision and forthrightness. There is a good reason for this. He brought about the circumstances that produced one of the most bitter fights in steel industry history.

It is his headache. The basic causes for that headache are apparently unknown to him. It may be that in another two-steps-forward-two-steps-backward move he will personally settle the steel wage-price snarl. If he does this it will mean that he can escape Supreme Court action on his confiscatory seizure of the steel industry.

The Supreme Court will soon act on Mr. Truman's actions. Until then he must sweat it out. His hands are tied on raising wages. Millions of people are stirred and shattered over the steel case. Soon they will know if a basic industry can be pushed from pillar to post by Mr. Truman without regard to the law or the facts. His headache is not at an end.

Tom Campbell

Editor

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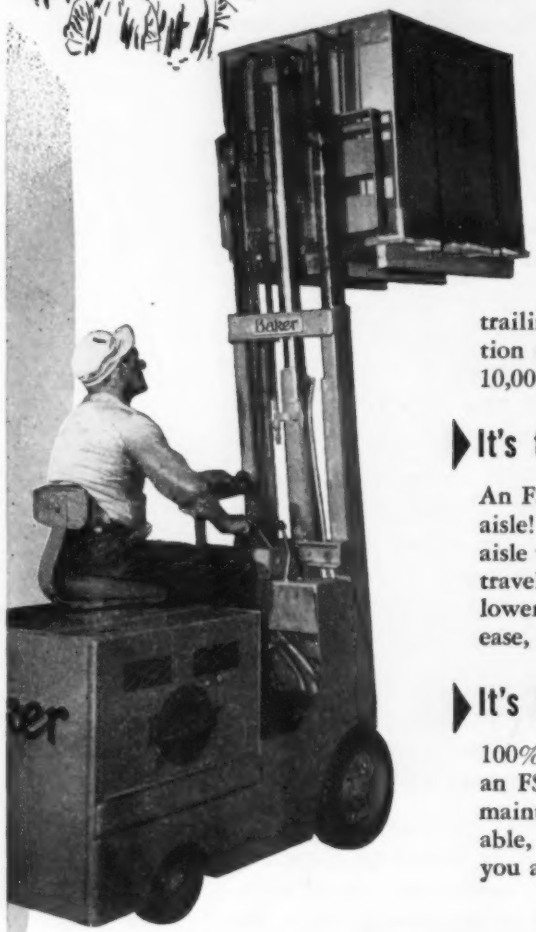

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Dear Editor:

Letters from readers

Fearless

Sir:

I have just read the editorial "Truman's Tantrum" in your Apr. 17 issue and, if you have them, would like to have about 85 copies to place in the hands of our distributors and salesmen throughout the United States.

J. B. DOAN
Chairman

American Tool Works Co.
Cincinnati

Sir:

As I read your splendid editorial "Truman's Tantrum" in the Apr. 17 issue I couldn't help but feel deeply, "Oh, how quickly industry could throw off the shackles of subtle 'dictatorship' were they to fearlessly band together in a constructive manner and in the name of all that is decent and fine, once and for all time put industry back on the high level of free enterprise." Courageous, fiery determination is all it takes—and lo! forces of light would come into action to accomplish it!

Active fearlessness is one powerfully constructive tool the sinister force goes down under. Why? Because the weapon it is inclined to use most is "fear" and when that force meets up with an individual or a nation that is absolutely fearless in the cause of freedom, or anything constructive, it means its annihilation. Therefore, only victory can result when real God-given fearlessness is brought into dynamic action.

Thank you without end for your inspiring editorials. Keep up the good work.

J. GODFRE

Philadelphia

Machining Titanium

Sir:

We would appreciate your sending us four sets of tear sheets of the article "How to Machine Titanium" by D. C. Goldberg and W. S. Hazelton appearing in your Apr. 17 issue. This is thc best article yet on the subject.

L. P. TARASOV
Research & Development Dept.

Norton Co.
Worcester

Method X Machines

Sir:

On p. 77 of your Apr. 3 issue we note an item on the Method X machine. We would like to obtain detailed information as to what this equipment is and its application.

S. G. BRADY
Chief Engineer

Machine Tool Div.
Gear Grinding Machine Co.
Detroit

The first article published giving details on Method X appeared in THE IRON AGE, July 26, 1951, p. 65. For further information write to M. F. Judkins, Firth Sterling Steel & Carbide Corp., McKeesport, Pa.—Ed.

Useful Reference

Sir:

We find your listing of New Tool Steels and Carbides, which appears in your Mar. 6 issue, a very helpful reference.

If it is available, may we have tear sheets of this article.

M. C. PARCHE

Carborundum Co.
Niagara Falls

Quartz Paper

Sir:

I note on the Newsfront page of your Apr. 24 issue that the Navy has developed a quartz paper to stand high temperatures. Who in the navy department should we contact for further information?

W. W. McKAIG

Cumberland Steel Co.
Cumberland, Md.

Write to the Dept. of Defense, Office of Public Information, Room 2C765, The Pentagon, Washington 25, D. C.—Ed.

Foam Rubber Dunnage

Sir:

We have recently seen a reprint of the article "Foam Rubber Dunnage Cushions Jet Engine Spares" by S. H. Breslow, which was reprinted from your Feb. 7 issue, and would appreciate obtaining about six tear sheets of this article as we found it to be very interesting.

J. F. VINGOE

Delany & Pettit Ltd.
Toronto

Metallizing

Sir:

I refer to the very interesting article published in your Jan. 31 issue entitled "Metallizing Cuts Marine Maintenance Costs" by Capt. Fred M. Earle.

I would greatly appreciate your forwarding me a few reprints of this article.

H. A. ALLEVIN

Harry A. Allevin
Buenos Aires

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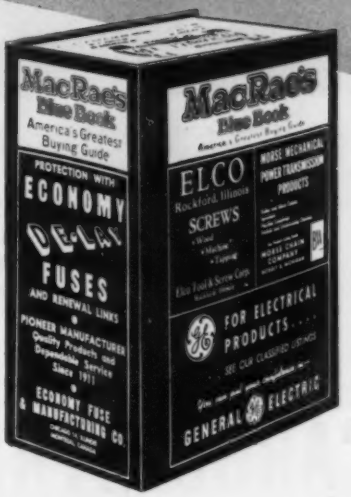

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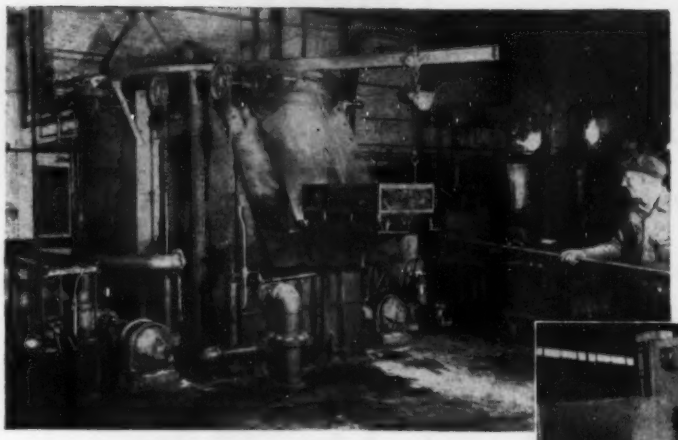
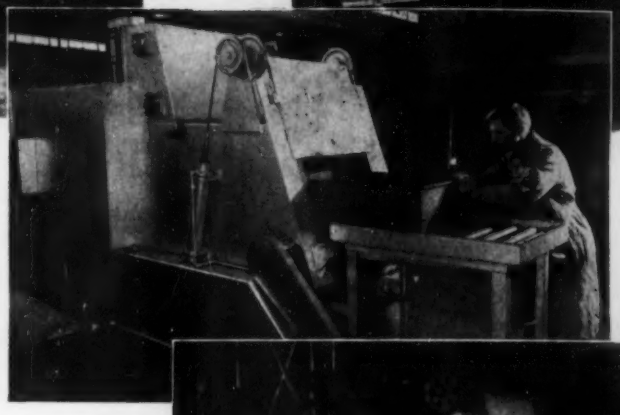
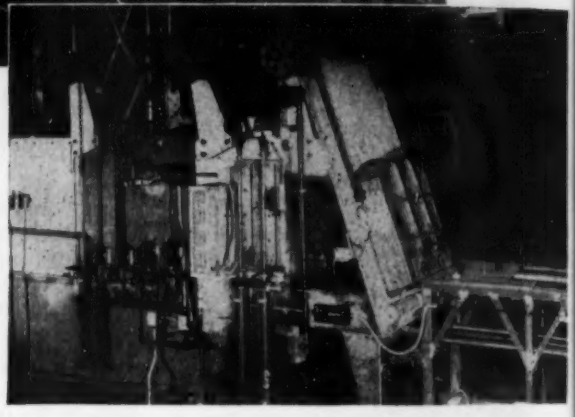






1. In Muskegon, Michigan, a Lindberg pusher type furnace carbonitrides bearings for military vehicles.
2. In Delavan, Wisconsin, a Lindberg tilting and vibrating hearth furnace carbonitrides instrument parts.
3. In New York, a Lindberg roller hearth furnace carbonitrides in a commercial heat treat plant.
4. In Evansville, Indiana, a Lindberg pusher type furnace carbonitrides farm machinery parts.

a complete line of

CARBONITRIDING FURNACES BY *LINDBERG*

Lindberg Engineering Company, builders of carbonitriding furnaces for many years, offers a full and complete line including tilting hearth, vibrating hearth, roller hearth and pusher types. Well known manufacturers from all parts of the country have turned to Lindberg carbonitriding for case hardening production runs of low carbon steel parts.

NEW RADIANT TUBE DESIGN . . . Lindberg carbonitriding furnaces now use a revolutionary new type radiant tube. The most important development in furnace construction in years, this new tube, tested and proved in Lindberg research laboratories, completely obsoletes conventional radiant tube design . . . watch next month's issue of this magazine for detailed information on this amazing new development in radiant tube design and construction.

TROUBLE FREE ATMOSPHERE GENERATORS . . . The secret of high quality carbonitriding lies in the atmosphere. With Lindberg, long the nation's largest producer of controlled atmosphere generators, you can be sure of precisely the correct atmosphere.

ADVANTAGES . . . Carbonitriding has many advantages. It's an inexpensive, safe, clean process that minimizes distortion. An instructive case-history article in a recent issue of "Iron Age" quotes production facts and figures based on two years' operation of a Lindberg carbonitriding installation in one of the world's largest heat treating plants. Write for your copy!

LINDBERG FURNACES

Lindberg Engineering Company

2450 W. Hubbard Street, Chicago, Illinois

Fatigue Cracks

by Charles T. Post

Expired

For the first time in many moons we had occasion to carry some important packages out of the office last Sunday. The place was deserted. The elevator operator, a stranger, eyed us suspiciously as he took us up.

When we re-boarded the elevator laden with the packages, he demanded our Sunday pass again, scrutinized it word by word right down to the office manager's signature—and there he balked.

"Never heard of the man," he said. We explained that the man had died several years ago and we had had no occasion to get a new pass.

The elevator man's suspicions solidified. He whisked us to the Sunday superintendent's office in the basement, no doubt with full intentions of putting us in irons. The Sunday super confirmed that there *had* been an office manager of the name signed to the card, but that we couldn't take out our packages.

"Your pass is no good," he grumbled. "The man's dead."

We argued to no avail for several minutes, finally pulled out an old dollar bill.

"George Washington's dead, too," we pointed out, "and so's the government man who signed this. Should we tear it up?"

The super got the point, let us out with our packages. Monday we got a new pass with a *live* office manager's signature.

Free Love

For years, we've tried to figure out a way to pep up your f.f.j.'s readership with a discreet mention of sex within the bounds of decency. But the reckless Russians can get mighty idealistic about any subject—sex included.

Komsomol Pravda, the Communist youth newspaper was quoted as emphasizing the other day that "free love" no longer is wanted in Soviet society. The paper gave f. l.'s original proponents a kick in the pants, and went on to say that "Love," which is the foundation of the Socialist family, is above all a community of spiritual interests.

Then the youngsters' paper laid down the law that love unites the Soviet people and is "inseparable" from the urge to devote all one's energy to the great cause of Lenin and Stalin.

Best piece of anti-Soviet propaganda we ever heard. Bet there's a democratic youth "underground" organized in Moscow any day now.

Blow

In a hotel where we stopped the other day, we found an individually packaged paper handkerchief in the bathroom. The wrapper explained that it was to be used "to remove cosmetics, to clean razors, for every handkerchief use."

The man who wrote the instructions might just possibly have been thinking of some incidental use, such as blowing the nose.

Puzzlers

The number which satisfies the conditions of last week's puzzler is 2178.

The ladder problem was easily scaled by L. D. Rice, Timken Roller Bearing Co. and R. W. Huff, Canton, Ohio.

The "land division" puzzle is still bringing replies. Last heard from are R. S. Fisher, National Carbon Co.; J. D. Dupuis, Pittsburgh; R. L. Faust, U. S. Steel Co.; E. L. Aul, Clark Bros.; A. L. Ciripompa, Wheeling Steel Corp., and E. Leach, International Harvester Co.

E. M. Hoover, Washington, is responsible for this one. Two horizontal gear wheels are in mesh and rotating. The smaller one, 30 in. in diameter, rotates once every 6 seconds. The larger wheel, 60 in. in diameter is located directly south of the smaller wheel. Two flies, John and Richard, are standing on the smaller wheel. John is on the rim and Richard at the center.

At an instant when John is at the northernmost part of his circuit, the two flies start walking, at equal speeds. John walks to the southernmost point of the rim of the big wheel and Richard to the center of the big wheel. Each travels by the quickest route, taking full advantage of the rotation of the wheels. They arrive at their destinations simultaneously.

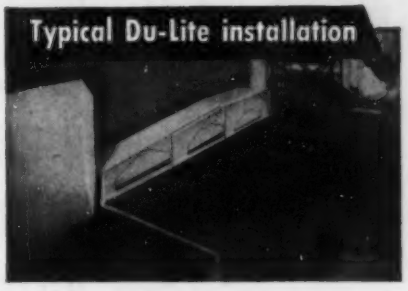
1. What is their walking speed?
2. How long does their trip take?
3. How many degrees from North is each facing when he starts out?

On any steel blackening problem

DEPEND on DU-LITE for a Superior Finish

Courtesy The Poly Choke Co.

Du-Lite gave this part with its complicated knurls, slots, threads, etc. a fine rust-resistant durable black finish. It is typical of many other parts, small and large, which have been black oxidized by Du-Lite for many years. Moreover, Du-Lite meets most individual and government specifications including 57-0-2C for Type III Black Oxide finish.



Du-Lite installations are simple, compact, easy to operate. Du-Lite equipment can be tailored to fit production requirements on all types of jobs with a maximum of speed and economy. Du-Lite also makes a complete line of cleaners, strippers, wetting agents, passivating agents, rust preventatives, burnishing compounds etc. for any metal finishing application.

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combine to make Iridite the most economical chromate finish you can buy. Many Iridite chemicals are packed in powder form, thus can be shipped to you in steel pails at freight savings of up to 75%! Pails take less storage space, are easier to handle, eliminate carboys, need not be returned.

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Conventions & Meetings

May 4-8—Electrochemical Society, semi-annual national meeting, Benjamin Franklin Hotel, Philadelphia. Society headquarters are at 235 W. 102nd St., New York.

May 6-9—Scientific Apparatus Makers Assn., annual meeting, Edgewater Beach Hotel, Chicago. Association headquarters are at 20 N. Wacker Drive, Chicago.

May 6-9—National Electrical Manufacturers Assn., international lighting exposition and conference, Cleveland Municipal Auditorium, Cleveland. Association headquarters are at 155 E. 44th St., New York.

May 7-10—National Screw Machine Products Assn., national meeting, St. Louis. Association headquarters are at 13210 Shaker Square, Cleveland.

May 8-9—National Assn. of Sheet Metal Distributors, spring meeting, Hotel William Penn, Pittsburgh, Pa. Association headquarters are at 1900 Arch St., Philadelphia.

May 8-10—Machinery Dealers' National Assn., annual convention, Waldorf-Astoria, New York. Association headquarters at 1346 Connecticut Ave., N.W., Washington.

May 11-14—Industrial Furnace Manufacturers Assn., Inc., annual meeting, The Homestead, Hot Springs, Va. Association headquarters are at 420 Lexington Ave., New York.

May 11-14—American Institute of Chemical Engineers, national meeting, French Lick Springs Hotel, French Lick, Ind. Institute headquarters are at 120 E. 41st St., New York.

May 12-13—Steel Boiler Institute, Annual Meeting, Hotel Hershey, Hershey, Pa. Institute headquarters at 1308 Land Title Bldg., Broad & Chestnut Sts., Philadelphia, Pa.

May 14-15—National Constructors Assn., Labor Committee, Copley Plaza Hotel, Boston. Association headquarters at 50 East 41st St., New York.

May 14-16 — Society for Experimental Stress Analysis, spring meeting, Hotel Lincoln, Indianapolis. Society headquarters are at Central Square Station, Cambridge, Mass.

May 18-21—Copper & Brass Research Assn., annual meeting, The Homestead, Hot Springs, Va. Association headquarters are at 420 Lexington Ave., New York.

May 19-20—Aluminum Wares Assn., annual meeting, Greenbrier, White Sulphur Springs, W. Va., Association headquarters are at 2311 First National Bank Bldg., Pittsburgh.

May 19-20—American Institute of Electrical Engineers, third conference on electron tubes, William Penn Hotel, Pittsburgh. Institute headquarters are at 9 Rockefeller Plaza, New York.

the Iron Age
FOUNDED 1855

THE IRON AGE Newsfront

► Shell mold castings of both gray and ductile iron have been successfully produced for 6 months in a pilot plant operation. Two men handle all operations on the specially designed 4-station machine used to produce the molds.

► Army Ordnance isn't making much fuss over it--but they recently produced their first production run of heavy artillery shells using sintered iron rotating bands. Powdered metals are now a permanent part of the military shell program and past the testing stage in that particular calibre.

Along with iron, powdered aluminum as a shell base is being given very strong consideration. It would be used as a sintered product. It sounds at least as feasible as ordnance's wrap-a-round steel shell case, fashioned from a flat sheet of steel. The latter would have worked, was discarded only for cost reasons, could still be used if cost became secondary.

► A survey just completed reveals that the metalworking and metal producing industry uses 18 pct of annual production of wire rope. Once thought of as a minor factor, it is now discovered to be second only to the oil and gas industry. Construction industry is in third place in wire rope use.

► The first large gyratory crusher equipped with a hydro-pneumatic cushion has just started operation in Minnesota. It is expected that maintenance costs will be negligible because the air cushion will absorb much of the shock normally transmitted throughout the equipment.

► Government intervention in the steel crisis has been costly to union, industry and taxpayers. Money spent on the case probably can never be totaled up accurately, but there's no question the bill will run to at least several million dollars.

When the United Steelworkers calls a strike today union leaders know the men will obey and stay out until they are ordered back to work. Not so in the organizing phase of the union 16 years ago. Strikes then were called with trepidation because union leaders were never sure of rank-and-file discipline.

► A core making machine using ultramodern controls and operated by two men has produced over 300 cores per hour in an actual production run. Automatic electric timers, solenoid air valves and air cylinders make up the nerve system of the machine.

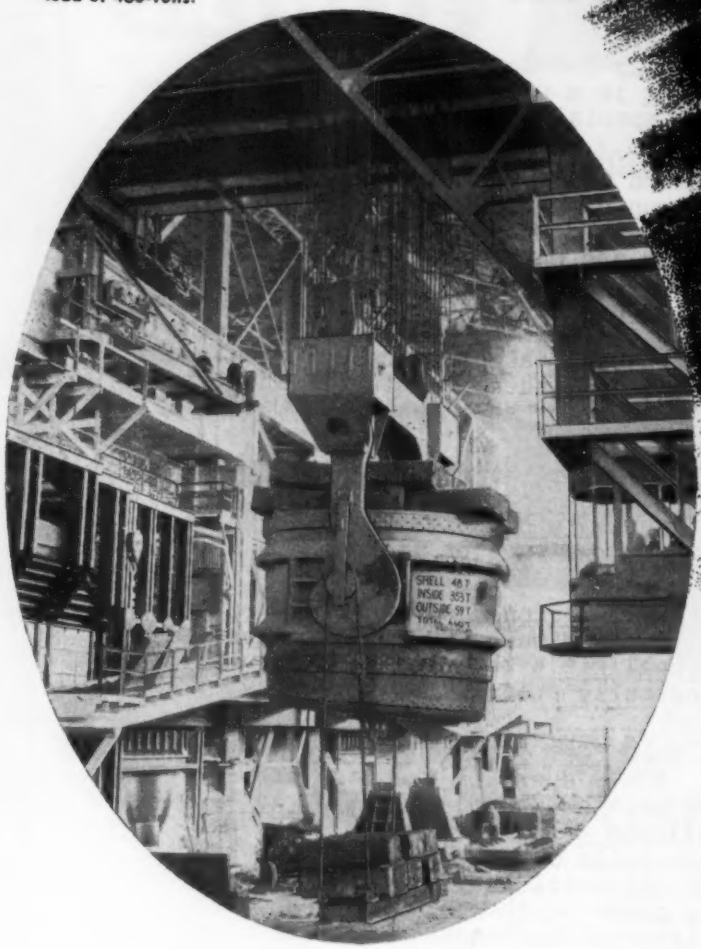
► A new type of diesel locomotive built to Army Transportation Corps specifications can run on tracks of varying gage, from U. S. standard up to the widest in use. Simple mechanical adjustment of wheels on the axles permits change from one gage to another.

► Aside from the humane angle, safety equipment often completely pays for itself in savings in insurance premiums and medical expenses. A study of 178 metalworking plants just completed by THE IRON AGE shows that in 44 pct of the plants safety equipment is fully paid for by these savings. More than 75 pct of the plants reported that 60 pct or more of their safety equipment pays for itself.

► Recent studies attempting to minimize the number of alcoholics overlook one thing: Management frequently doesn't recognize any save the most advanced cases. Occupational studies of alcoholics applying for treatment show the vast majority to have been regularly employed at the same job for the last 5 years. In most cases management was unaware of their problem.

SAFE Crane Control

New 300-Ton ladle crane with EC&M Control successfully handling a test load of 460-Tons.



New dynamic lowering circuits for d-c crane-hoists come and go—are superseded by other new circuits, but the well-known EC&M Wright Dynamic Lowering Circuit Hoist Controller continues to be first choice for industrial cranes.

Quick brake-release and fast-operating LINE-ARC Contactors permit accurate spotting of heavy loads—resulting in fewer inching movements, which maintenance men recognize as a contributing factor to reduced upkeep.

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STEEL: Truman-Dictated Settlement Flops

President makes no concrete offer to industry . . . USW's Murray sticks to WSB recommendations as gospel . . . Industry helpless to settle . . . Supreme Court has case—*By J. B. Delaney.*

A snappish President Truman sternly told the United Steelworkers and the industry that they had better settle their dispute at Washington meetings over the past weekend. He gave the steel industry a vague offer of price rises to come after it had settled with the union. Negotiations flopped. The President's threat to impose new working conditions by raising wages on last Monday turned to empty words when the Supreme Court banned that course of action.

The union hewed to the wage line advocated by Wage Stabilization Board and insisted on the union shop. Against those formidable demands the companies were helpless to settle. President Truman had done nothing to pave the way. He made no concrete price offer to the industry and obviously had done nothing to soften Mr. Murray's wage demands.

No Incentive—The steel industry had not a shred of incentive to settle. They prepared to carry the seizure battle into the Supreme Court after that body voted 7-2 to take the case. The Court of Appeals had stayed the injunction outlawing seizure.

Meanwhile, workers were filing back to work. At first reluctant to open the mills because of uncertainty as to whether the union would walk out again, the industry generally started operations and sought to resume full production. Mr. Murray made it plain he had no intention of striking against the government.

This strike had cost the country about 1.5 million tons of steel. With the previous shutdown, the total was 2.5 million tons.

Federal District Judge David A. Pine on Apr. 29 handed down a history-making decision denying President Truman's claim of "inherent" power in seizing the steel industry to head off a strike that had been scheduled for Apr. 9.

JUDGE PINE: ". . . seizure is without authority in law or the Constitution."

When Philip Murray, union president, heard of the decision, he ordered an immediate cessation of work on a "no-contract-no-work" basis. Word went out from Pittsburgh by telephone and the strike was on.

The strike caught the industry by surprise. There was a great deal of confusion and scurrying around to get the mills shut down in orderly manner. Pickets appeared within 30 min of public knowledge of the Judge's decision. Scattered violence flared at several Pittsburgh district mills. Next day the industry was virtually down flat.

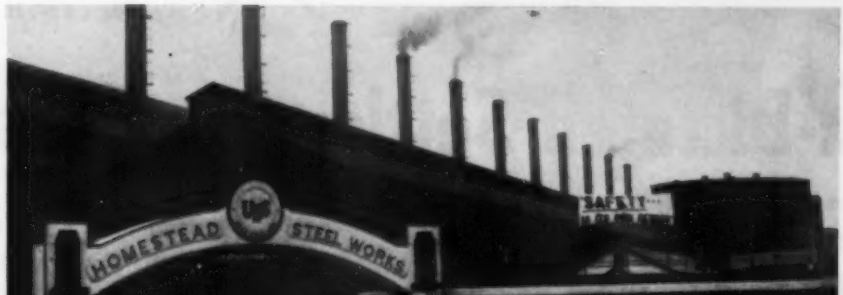
Trouble—Some companies had trouble. At the Pittsburgh and Aliquippa plants of Jones & Laughlin the union failed to provide maintenance workers. Blast furnaces and coke ovens at the Pittsburgh Works were left in "bad shape," but supervisors and salaried workers finally completed the shutdown.

Cooperation in blast furnace shutdowns at Pittsburgh operations of U. S. Steel was spotty. At several plants the workers walked off the jobs leaving molten steel in openhearth furnaces and there were anxious moments before the men returned to tap out the steel.

The walkout affected virtually all producers, with these notable exceptions: National Steel Corp. plant at Weirton, W. Va.; Armco plants at Middletown, Ohio, and Butler, Pa.; Barium Steel; and Kaiser Steel. The latter two have signed interim agreements based on Wage Stabilization Board recommendations. The Weirton and Armco plants are not under contract with the United Steelworkers.

Back to Work—But last Friday, in response to an appeal from President Truman, the union called off the strike, and workers were re-entering the mills that same afternoon. Production came back to normal.

Production losses virtually assured a high industry operating rate for balance of the year. Before the walkout responsible industry executives, aware of relatively high consumer inventories, foresaw a decline in the ingot rate to as low as 88 pct of capacity in the fourth quarter. But the strike loss of 2.5 million tons may not soon be regained by an industry



FAST MOVE: Smoke was still swirling out of stacks at U. S. Steel's Homestead Works when picket lines were set up following Phil Murray's strike call.

that will resume top production where it left off.

U. S. Appeal—Judge Pine had issued an injunction ordering the government to hand the mills back to the owners. But it wasn't long before the government had possession again. On an appeal by U. S. attorneys, the U. S. Circuit Court of Appeals decided 5-to-4 to stay Judge Pine's order pending a government appeal to the U. S. Supreme Court.

Judge Pine's decision was not unexpected in view of the backtracking by President Truman and Justice Department attorneys before and after legal arguments on the case. The gist of it was that the President had seized the industry "without authority in law or the Constitution."

"There is no express grant of power in the Constitution authorizing the President to direct this seizure."

Less Harmful—From the public viewpoint, Judge Pine said, a strike would be less harmful than a decision sustaining the President's claim of "inherent" powers. He said:

". . . I believe that the contemplated strike, if it came, with all its awful results, would be less injurious to the public than the injury which would flow from a timorous judicial recognition that there is some basis for this claim of unlimited and unrestrained executive power, which would be implicit in a failure to grant the injunction.

Without Authority—At another point the judge said the claim that the President has the power to meet all emergencies without being subject to judicial review "spells a form of government alien to our Constitutional Government of limited powers. I therefore find that the acts of defendant are illegal and without authority of law."

TIED UP: Gondolas loaded with steel shipments stand in the yards of U. S. Steel's Chicago Works after the plant was idled by last week's strike.

Benefits:

Stock, retirement plans may be started without U. S. approval.

Conditions under which an employer may place in effect pension, retirement annuity, deferred profit-sharing, or stock bonus plans without prior government approval are defined in General Salary Stabilization Reg. 6. Order was issued Apr. 25.

No Approval—Such plans, when operating for the sole benefit of employees or their beneficiaries, will not require approval if they meet these requirements:

1. If there is a trust, it qualifies as exempt from Federal income tax under Section 165 (a), Internal Revenue Code;

2. Annual contributions by the employer do not exceed the maximum amount authorized as a deduction under Section 23 (p), Internal Revenue Code;

3. No payment or distribution of any benefit be made to any participating employee or his beneficiary except in the case of permanent disability or death, or expiration of 10 years from the date of initial employer contribution. This rule is modified to allow payment of pension trusts and retirement annuities when the employee meets retirement requirements.

FURNACES: Shutdown Damage Costly

Repeated shutdowns of blast furnaces, openhearths will skyrocket maintenance costs . . . Life of refractories shortened by strain . . . Coke ovens suffer, too—*By J. B. Delaney.*

The steel industry will be paying through the nose for months to come for the repeated shut downs and start ups of steel, iron, and coke-producing facilities.

Maintenance costs are almost certain to rise steeply as the result of the shutdowns necessitated by near-strikes and strikes of steel workers.

Reluctant to Open — The on-again, off-again strike tactics of the United Steelworkers of America have forced the steel industry into desperate action to cool blast furnaces and openhearths and start them producing again. The strain on equipment has been terrific. Even when Philip Murray, USW chief, ordered workers back to the mills some plants were reluctant to accept their services.

They did not know whether or not the union would call another shutdown. This week production was slated to reach its normal rate.

Fact of the matter is that the life of furnace and coke oven refractories is materially shortened by temperature extremes incident to production curtailments.

Campaign life of openhearth furnaces will be reduced. Damage will be greatest to older openhearths and those nearing the end of their campaigns. Furnace roofs will be the first to go. Steel producers have already advised refractories suppliers to brace themselves for heavy orders for roof brick. In some instances it may be impossible to start up furnaces without first rebuilding.

Out of Blast—Blast furnace operators are concerned over the danger of spalling and breakouts. As a result of the "near-strike" of last Apr. 8-9, a blast furnace of American Steel & Wire Co., at Donora, Pa., was shut down for repairs months ahead of schedule.

Coke ovens will suffer, too, although it was not considered likely that oven temperatures were permitted to fall below the danger point of 1200°F. However, there are plenty of overage ovens throughout the country that even before the shutdowns were being held together only by ingenuity and stop-gap repairs.

Approximately 42 pct of existing units have been in operation beyond their normal life expectancy of 25 years. Serious damage to these ovens will heighten possibility of a coke shortage by mid-1953, as has been pointed out by Defense Solid Fuels Administration. (THE IRON AGE, Mar. 20, 1951, p. 51.)

IDLE VALLEY: Pittsburgh's "industrial valley" took on a look of unaccustomed calm as an estimated 125,000 steelworkers stayed off their jobs.

Press Castings from Europe

With American foundries capable of producing extra-heavy castings already over-booked, Europe is being studied for possible sources to speed the military's heavy press program.

Blueprints in hand, a team of specialists composed of industry and government officials as well as a procurement officer left for Europe last week to inspect selected French and German plants.

The procurement officer has authority to place on-the-spot orders for castings with qualified plants. Group will be in the market for at least 69 kinds of castings ranging from 50 to 150 tons.

Largest forging press in this country is rated at 18,000 tons, and the biggest extrusion press at 5500 tons. But the Air Force wants eight giant presses ranging from 25,000 to 50,000 tons in applied pressure as well as nine big extrusion presses ranging from 8000 to 20,000 tons pressure.

If the castings can be obtained in Europe, the Air Force believes, first of the new presses could be completed early in 1953.

The treasure hunt has been approved by defense mobilization officials. They say that if the needed castings can be had from European foundries, there will be neither the delay nor disruption of other scheduled production by U. S. foundries.

Boiler Output Hit First

Steel plant shutdowns immediately affected boiler production schedules and, in turn, would have hit power expansion programs with full impact, industry representatives have reported to National Production Authority.

The industry felt the effect right away, the Agency was told, because it was already having trouble getting steel plates in large widths and sizes as well as stainless steel tubing and alloy piping in sizes larger than 10 in.

Insufficient allotments are hurting smaller plants on a 1-shift operation more than larger plants which operate on a 3-shift basis, the industry says.

INVENTORY: How Long Could You Last?

Strike starts metalworkers in mass check of steel reserves to see how long they could ride it out . . . Iron Age survey shows stockpiles ran from 30 to 45 days — *Staff Report.*

The steel strike last week and National Production Authority's lightning-quick order freezing all warehouse steel for defense production sent many thousands of steel users scurrying to check inventory. The problem was posed of how long the metalworking industry could continue operations before butting into the blank wall of depleted steel stockpiles. The picture was generally optimistic.

End of the shutdown calmed fears. But its onset resulted in authentic and sometimes surprising conclusions on steel inventory.

A nationwide survey conducted by THE IRON AGE just as the strike started revealed that a great many manufacturers had steel reserves of from 30 to 45 days—and in some cases 60 days. Many feared production could be troubled by specific shortages of long-scarce items such as alloy and carbon steel bars, plate, and structurals.

Detroit automakers predicted that manpower layoffs would have had to start in 10 to 14 days after the strike, assuming that it had continued. It was believed that in a month's time auto output would have been virtually layed low. Detroit's parts suppliers would have caught the first smack of the storm. Sporadic shutdowns by suppliers would have driven Detroit auto producers frantic later.

Strike Umbrella — Ford Motor Co. had partial strike protection. Its River Rouge steel mill was not in the clutches of the United Steelworkers and had never participated in a USW strike. It was seen that Ford would be able to maintain some production indefinitely because its mill provides half of Ford's steel.

Some major steel producers told IRON AGE that inventories of their customers had slipped slightly in the past month because of the previous shutdown that had cost 1 million tons of steel. Nevertheless they estimated that consumers' inventory ran up to 45 days, with most somewhat below that figure.

Manufacturers in the Midwest appeared to have inventories of a month or so. Supplies of sheets, light plates, light shapes, wire and rod were good but on the other hand stocks of bars and plates were low. This imbalance may have cut the ability to make full use of more plentiful steel items. Battle plans for substitutions were already being mapped.

Substitution — A check in the Cleveland area revealed that manufacturers had from 30 to 60 days of steel in stockpile. After a month, though, it was certain that manufacturers would have had to substitute liberally. One large plant reported its reserve of alloy bars desperately tight—from a week to 10 days. On other steel items supply ran from 30 to 60 days. SOS calls from this firm for surplus steel had already been dispatched to suppliers.

"From what you tell me, Mr. Jones, it's obvious that these ghastly steel strike ideas you have are just hallucinations."

Another Cleveland manufacturer considering the strike told IRON AGE he could operate for from 45 to 60 days before running into serious trouble. A Cleveland stamping plant using cold-rolled coils almost exclusively said it could keep going for from 30 to 45 days and then would start substituting. Plants in all districts indicated plans to ration their steel to stretch out production.

A medium-sized Cleveland maker of materials handling equipment said its inventory position was good for at least 60 days—even on short alloy bars.

Civilian Users—St. Louis manufacturers told IRON AGE that inventories were healthy, in better shape today than they had been for 5 years. Stockpiles could carry local industry for 30 to 60 days, barring dislocations of some very scarce products.

But small civilian products manufacturers had a different stockpile story to tell. Some were unable to store large inventories because of financial considerations. They relied on periodic warehouse purchases—and yet NPA had cut them off from the main source of their steel. In 2 weeks and sometimes before the smaller civilian plant expected to be hurting if the strike had continued.

Although all warehouse steel was put at their disposal because of the strike, defense producers could not repress a shudder. They exerted a greater demand for such very scarce products as alloy steels, bars, heavy plates. They were vulnerable to disruption of production because of specific shortages. And since military specifications were exacting, substitutions were not as feasible.

Machine tool makers had expected the strike to affect them almost immediately. This industry uses small amounts of a diversity of steel products and types of steel. Steel is ordered as production demands—in small lots. Large inventories are not practical.

NONFERROUS: Prices In New Shuffle

Lead, antimony cut following foreign dips . . . Zinc shows similar but slower pace . . . Chile ends agreement with U. S. on copper . . . Aluminum prices on way up —*By R. L. Hatschek.*

Price cuts in antimony and lead last week were the first nonferrous decreases in a long time. Prices have been climbing whenever Office of Price Stabilization would allow it. Antimony dropped 6¢ to 44¢ per lb, f.o.b. Laredo, Tex. Lead followed with two 1¢-dips to 17¢ in New York and 16.8¢ in St. Louis.

Antimony, both domestic and imported, had been selling for 50¢ per lb, depending on grade and packaging. Then foreign prices were shaded and the metal could be imported at 40¢ to 45¢.

Immediately after that a leading domestic producer reduced prices to 44¢. The next day prices in the United Kingdom were cut the equivalent of 4⅜¢ per lb to 39.69¢. At the same time another domestic producer slashed his price to 44¢.

Lead was reduced next. Users had previously felt that a dip was likely and did not come heavily into the market. They purchased little more than their immediate needs, neglecting inventories. This left producers with oversize stocks. Another factor was reduced stockpile buying which stemmed from a lack of funds for the purpose, it is reported.

As with antimony, foreign lead was available for import at less—only 17.5¢ per lb at New York docks.

Like Pattern — Zinc, frequently referred to as lead's twin metal, is demonstrating a very similar pattern—only with a time lag. Demand from galvanizers for Prime Western zinc has been, and still is, high. This is the main factor causing the time lag—but producers expect zinc to dip eventually.

Current domestic price for zinc is 19.5¢ per lb on an East St. Louis basis. Foreign metal is quoted at the same figure at Gulf ports and trading in imported zinc is described as sluggish. Only a few months ago foreign zinc prices were well in excess of 33¢ per lb. At that time foreign lead was also well over domestic ceiling prices.

The copper situation is quite different. World price is about 38¢ as against a 54¢ top some months ago. But this is still well above the domestic ceiling of 24.5¢ per lb and the 27.5¢ permitted on imported copper and copper smelted from foreign ores.

Harmful Strikes—Copper is generally described as being one of the tightest metals — only nickel can be described as tighter. There is little hope that supply and demand can be balanced soon.

Strikes at two mines in Chile, which produce about 22,000 tons of copper a month, will hurt. The strike at American Smelting & Refining Co.'s Garfield smelter will also damage supply. Output of the Garfield smelter is also about 22,000 tons of copper a month.

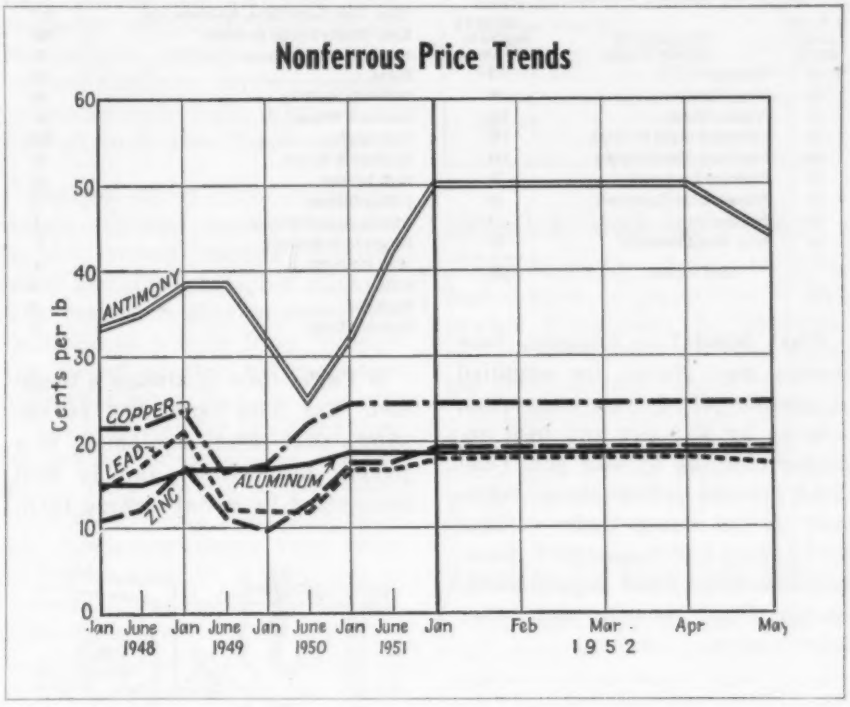
Another factor in the copper price picture is Chile's desire to alter its pricing setup.

The U. S. was getting 80 pct of Chile's output at 27.5¢ per lb with the rest being sold in world markets at going prices. Chile has just abrogated the U. S. agreement (see p. 172).

Now that 38¢ is the top world price the Chileans want to boost prices to the U. S. by 6¢ and sell all their production here. This would give them almost the same total income as before. Status of negotiations is doubtful.

Different Picture — Aluminum prices will move up rather than down. Factors here are entirely different from the previously mentioned metals. Aluminum's long-term price trend has been downward, although the last few changes, not recent, have been up.

Future prices of the light metal are completely dependent on the present steel wage case. The aluminum settlement is merely waiting for the one in steel. When the inevitable wage boosts are granted the industry says it must raise its prices from the present 19¢ per lb for ingot. The jump will be 1¢ to 2¢—if OPS allows it.



SAFETY: How About Your Plant?

Iron Age survey finds management favors providing personal safety equipment to workers . . . Goggles lead list . . . Program pays its way . . . Insurance, medical savings defray costs.

What personal safety equipment does American metalworking supply to its employees? Whose responsibility is it? How much does it cost? And is the expense worthwhile?

THE IRON AGE'S Market Research Div. surveyed 2000 metalworking plants of various types and sizes to get answers to these questions. Replies were received from 526 plants, a response of 26 pct:

Classification of Responding Plants by Industry Groups

U. S. Std. Industry Codes	Description of Industry Groups	No. of Replies in Each Group
19	Ordnance	3
25	Metal Furniture	15
33	Primary Metals	106
34	Fabricated Metal Products	138
35	Machinery Manufacturers	165
36	Electrical Equipment	34
37	Transportation Equipment	45
38	Instruments	6
39	Misc. Metal Products	14
	Total Replies	526

What Kinds? — Goggles, face shields, and gloves are supplied by over 80 pct of those answering, helmets by 53.9 pct and heat resisting clothing by 40.8 pct. One-third provide safety shoes, while over 20 pct equip their workers with aprons and respirators. Lesser numbers of firms supply boots, masks, finger guards and other safety items.

Plants Purchasing Personal Safety Equipment for Employees

Type of Equipment	No. of Plants Purchasing
Goggles	525
Face Shields	461
Gloves	431
Helmets	284
Safety Clothing (heat resisting)	215
Safety Shoes	175
Aprons (rubber, leather, etc.)	136

Need for continuing safety education is shown by reports that only 50.2 pct find no difficulty in persuading workers to wear the equipment. Over 48 pct have trouble in securing employee cooperation.

Goggles—Survey responses make a strong case for goggles. Eye injuries are the second most common type of accident, accounting for 38.4 pct. Only minor cuts and lacerations lead, with 41.2 pct. It is obvious from the other types listed many should be classed as minor:

Most Common Types of Accidents

Minor Cuts, Lacerations, Abrasions, etc.	217
Eyes (Mostly foreign particles)	202
Hand and Finger Injuries	55
Burns	49
Materials Handling	35
Sprains & Strains	27
Foot Injuries	24
Splinters & Slivers	17
Back Injuries	14
Falling Objects	7
Striking Against Objects	7
Caught In or Between	6
Wire Punctures	6
Falls	5
Fractures	3
Chemical Sores	3

It Pays—Cost is always a bugaboo. But THE IRON AGE survey shows that safety equipment is a paying proposition, and is well recognized by metalworking management. Advantages—aside from the humane angle—as reported by 459 companies:

Advantage	Plants Reporting
Savings on Insurance Premiums and Medical Expense	149
Keeps Employees on Job. Less Absenteeism	91
Better and More Production	79
Improved Employee Attitude	68
Reduction in Severity and Frequency Resulting in Fewer "Lost Time" Accidents	56
Better Community Relations	4
No Advantages	14

"Are you sure you wanted me to work overtime tonight, Mr. Dunhill? Everyone else seems to have gone home."

Much of the cost of safety equipment is made up directly by savings on insurance premiums and medical expense. Table shows how these savings work out for 178 plants:

Plants Answering	Pct of Personal Safety Equipment Paid for by Insurance and Medical Savings
78	Pays for 100%
31	Pays for 75% to 99%
25	Pays for 40% to 60%
15	Pays for 20% to 30%
15	Pays for 10% to 15%
14	Pays for none

Who's in Charge?—Of 526 companies, only 201 have full-time safety directors. But over 91 pct of the plants with over 2500 workers employ one, against 19.5 pct for plants of 100 to 249 workers. Considering the recognized value of safety direction, it undoubtedly is a major part of the duties of other executives in the smaller companies:

Size of Plant by No. of Workers	No. of Plants Employing a Full-Time Safety Director (Out of 526 Replies)	Pct of Plants Employing a Safety Director
100 to 249 Workers	44	19.5%
250 to 499 Workers	40	33.3%
500 to 999 Workers	44	51.1%
1000 to 2,499 Workers	42	68.8%
Over 2,500 Workers	31	91.1%

Selection of safety equipment is not, in any case, limited to safety directors. Others must necessarily be consulted on aspects under their jurisdiction. Table below shows men influencing selection of equipment in 501 plants:

Title	No. of Men Selecting
Works Managers and Plant Supts.	248
Safety Directors and Safety Engineers	198
Personnel and Employment Mgrs., and Industrial Relations Mgrs.	162
Purchasing Agents	140
Departmental Supts. and Foremen	98
Company Officers and General Managers	84
Plant and Manufacturing Engineers	44
Doctors, Nurses, First Aid	22
Other Titles	22

STEEL: Profits Take A Beating

First quarter reports show the industry makes everything but money . . . New records for output, shipments, sales . . . Rising costs and high taxes trim earnings—*By W. V. Packard.*

First quarter steelmaking operations again smashed almost every record on the books—except earnings. Starting the year with an alltime high capacity, the industry set new marks for production, shipments and sales. But earnings were about 19 pct lower than during the first quarter last year. Rising costs, taxes, are to blame.

The 19 pct decline in earnings is based on reports from the top 10 producers. In the first quarter of 1951 they earned $140,438,010, compared to only $113,846,136 of net income during the first quarter of this year. The difference is $26,591,874. Comparison of earnings for individual producers is shown in the accompanying table.

Net income pct of sales for U. S. Steel was down to 5 pct compared with 5.9 pct during the first quarter of last year. In 1950 their earnings were 7.3 pct of sales.

Profit Squeeze—The squeeze on profits is largely responsible for the resistance steel companies have offered against union and government efforts to force a large wage increase without a compensating price increase. They just can't afford it. This is especially true in view of large sums of money they are committed to spend on their expansion programs.

During the first quarter of 1951 the industry produced 25.7 million net tons while operating at close to 100 pct of rated capacity. Yield for the entire year 1951 was 105.1 million net tons.

First quarter 1952 production for the industry totaled about 27.2 million net tons, while the industry operated at about 100.6 pct of rated capacity. This is at an annual rate of about 109 million tons.

The outlook for the second quarter is not at all bright. The first short strike, which started Apr. 8, cost very close to a million tons of lost production. The second strike, which was called on and off last week, will have cost another 1.5 million tons or more by the time all losses are counted up.

Big Loss—Carving at least a 2.5 million ton production loss out of the quarter is only part of the story. It costs money to start and stop furnaces. In addition to the production losses, refractory furnace linings have to be repaired or replaced.

With one or two exceptions company officials indicated that their projected expansion plans would be carried through. But they warned that any further squeeze on profits might make it even more difficult to finance these projects.

Outlook—Most of the larger producers reported demand for steel is still strong, though backlogs have begun to contract slightly. The outlook is that business will continue at a high level through the second quarter, but may ease somewhat after that.

The prospects for small and nonintegrated producers is not so good. They are not able to keep their order books filled, and some are producing items they don't normally make in order to keep their facilities employed. Usually these items are less profitable. This is already beginning to show up in their earnings reports, which show their profits sinking faster than those of the large companies.

Grim Fight—The grim and bitter struggle over wages and prices cast some gloom over earnings press conferences. Company officials generally spent more time explaining their position on these issues, and government seizure, than they did on earnings. They made it clear that they regard the seizure of their plants as the far more important issue.

Steel Company Earnings

Company	First Quarter 1952	First Quarter 1951
U. S. Steel	$43,534,212	$48,663,791
Bethlehem Steel	18,926,045	25,066,205
Republic Steel	11,759,513	12,271,377
Jones & Laughlin	4,711,000	7,673,000
National Steel	8,772,466	11,605,401
Armco Steel	8,014,633	10,443,240
Youngstown Sheet & Tube	7,038,787	8,580,142
Inland Steel	6,936,470	9,318,270
Wheeling Steel	2,782,208	4,288,744
Sharon Steel	1,370,802	2,527,850
Colorado Fuel & Iron	1,381,202	2,805,388
Kaiser Steel	7,942,308	5,539,731
Crucible Steel	1,429,243	2,206,296
Pittsburgh Steel	748,111	1,801,144
Barium Steel	741,739	1,875,509
Allegheny Ludlum	1,459,813	2,707,056
Granite City	993,504	1,431,385
Lukens Steel	*1,623,603	*2,010,353
Detroit Steel	1,509,741	3,316,567
Alan Wood	411,558	776,576
Copperweld Steel	456,529	788,725
Rotary Electric	379,844	582,143
Keystone Steel & Wire	1,320,746	2,018,417
Midvale Co.	332,030	270,370

* First two quarters of fiscal year ended Apr. 19.

Alcan Asks Stock Registration

Aluminum Co. of Canada, Ltd., has applied to Securities & Exchange Commission for registration of $90 million worth of sinking fund debentures due 1970.

Net proceeds are to go substantially to assist financing of the firm's $350 million expansion program, due for completion in 1954.

American Can Files Stock Notice

American Can Co. has filed a statement with Securities & Exchange Commission seeking registration of 989,599 shares of common stock ($12.50 par). Subscription price will be filed later.

Stock is first to be offered to common stockholders at the rate of one share for each ten already held as of May 8. At that time, a 2-for-1 stock split will have become effective.

Funds realized are to help finance the expansion program and to build inventories consistent with increasing sales volume, officials explained to the SEC.

CMP: Planners Fight to Keep It

Agencies claim return to free market would hit small business . . . NPA sees strike-caused steel shortage, asks controls extension . . . FTC charges discrimination in steel shipments.

While government planners were urging Congress to keep CMP alive for an indefinite period to assure small manufacturers a "fair share" of steel production, National Production Authority officials were making warning noises that last week's strike could mean a revived shortage and a longer need for controls.

This was an insight into government thinking that controls must be retained. NPA men went on record as convinced that the strike now made it impossible to drop steel distribution controls in the last quarter of 1952 and possibly in the first quarter of 1953.

NPA also acted eager to cut back auto and appliance production and commercial building if the strike lasted for too long a period. The agency remained oblivious to the well-grounded supposition that the steel industry could recover quickly from the short strike without any grievous damage to supply.

Discrimination — Meanwhile, government forces attacked the decontrol movement from another flank: Abandonment of steel distribution controls would cut the small businessman's share of steel. And the Federal Trade Commission came prepared to prove it before the Subcommittee on Monopoly of the Senate Small Business Committee.

In a report released last week, *Distribution of Steel Consumption, 1949-1950,* FTC reviewed charges originally raised in the Senate in 1947. The commission said the situation was probably worse today than it was 5 years ago. Charges of discrimination in steel distribution include:

(1) Disproportionate increases in shipments to fabricating facilities and warehouses owned by steel producers.

(2) Increased sales of cold-rolled and other highly finished types at the expense of the less costly hot-rolled.

(3) Limiting of shipments to areas close to steel producing centers.

Increases—FTC stated that the industries which showed the greatest carbon steel consumption increase from 1949 (a year of relatively ample supply) to 1950 (shortage) were: Heating and cooking apparatus, 73 pct; bolts, nuts, washers, rivets, 67 pct; metal stampings, 2 pct; wirework, 53 pct; metal drums, barrels, pails, 44 pct. (These industries produce all-metal items. If they had been in a depressed state in 1949, the rise would be more phenomenal for all-metal items if good times came than for industries making part-metal products.)

FTC claimed the steel industry owns about 71 pct of the steel barrels and drums industry, 15 pct of the wirework industry, and 12 pct of the nuts, bolts, rivets field.

Hurt Small Business—This and other FTC data indicate, according to the Senate Small Business Commission, that industry control over distribution in time of shortage may injure small business for two main reasons:

(1) Sharpest increases in steel consumption are in those industries owned in part by steel producers or some of their biggest customers, the automobile and appliance industries.

(2) Warehouse shipments favor warehouses affiliated with producers against the independents.

Any proposed relaxation of CMP faces tough sledding in Washington in the coming months. Federal agencies are naturally reluctant to have their regulatory powers over steel distribution removed or even substantially modified. They are prepared to put up a stiff fight, in which they hope to be supported by small, independent fabricators.

"Things going pretty smoothly these days?"

Industry Controls This Week

Aluminum—Amend. 1, M-5 permits producers to accept orders equal to 125 pct of their authorized production schedules, including backlog.

Brass—Amend. 1, CPR 127 allows sellers of brass or bronze ingot who make deliveries in their own vehicles to make transportation charges equal to the sum by which the public motor carrier rate exceeds 35¢ per cwt.

Die Casters — Amend. 6, CPR 60 allows a 4 pct ceiling increase.

Price Changes — Amend 2, SR 2, Rev. 1, CPR 22, and Amend. 2, SR 1, Rev. 1 enables manufacturers to ignore determination of insignificant price changes.

Sebacic Acid—Revocation of Sched. 7, M-45 removes controls.

Shipping Drums — Revocation of M-75 lifts controls on sale, delivery and use of steel shipping drums. Products are still subject to 60-day inventory limitation of NPA Reg. 1.

Steel—Dir. 11, CMP Reg. 1 prohibits shipment and acceptance of steel except for defense purposes. Amend 1, Dir. 1, CMP Reg. 1 enables manufacturers to obtain increased quantities of carbon steel, alloy steel and aluminum without filing CMP-4B.

Welding—Amend., Sched. 5., M-80 permits users of low carbon austenitic stainless or austenitic steels stabilized with columbium, tantulum or titanium, to employ columbium content rods for welding.

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Tinplate Export Quotas Boosted

Quotas for second quarter secondary tinplate exports have been increased by 12,500 tons. This tonnage will be used largely to fill orders for food and petroleum packaging abroad.

A breakdown of the supplementary quota shows 6250 tons of mill accumulations and the same tonnage for waste waste.

Addition of these tonnages brings total second quarter secondary quotas as mill accumulations to 31,250 tons; waste waste, 21,250 tons; unmended menders, 15,000 tons; and circles, strips, cobbles, etc., 7500 tons, for a total of 75,000 tons of secondary.

Steel Shipping Drum Curbs Lifted

All controls over the sale, delivery and use of steel shipping drums have been lifted through revocation of M-75, effective last week.

Enough sheet is in sight to supply the industry, National Production Authority says.

Revocation of the order leaves these products subject to the 60-day inventory limitation of NPA Reg. 1. This amounts to boosting the inventory ceiling by 15 days, since M-75 applied a 45-day level for both new and used drums.

Users may also continue carload or truckload purchases provided delivery is not accepted until the stock level falls below a 45-day supply.

Set Hauling on Brass, Bronze

Transportation charges to be applied by sellers of brass or bronze ingot who make long-distance deliveries in vehicles they own or control are described in amendment 1 to Ceiling Price Reg. 127, effective May 10.

Amdt. 1 allows for transportation charges an amount equal to the sum by which the public motor carrier rate exceeds 35¢ per cwt. This 35¢ sum was the maximum allowable in ceiling prices set by CPR 127, as originally written.

GCPR Retained for Minor Changes

Two new government pricing actions, effective May 6, permit manufacturers generally, and those publishing price lists in particular, to ignore determination of insignificant price changes.

Manufacturers who compute prices from General Ceiling Price Reg. ceiling prices rather than base period prices may retain GCPR ceilings where the change is less than 1 pct.

Total effect of this authorization is likely to be slight because most of the price determination concerned has already taken place.

Actions involved are Amendment 2 to Supplementary Reg. 2, Revision 1, under Ceiling Price Reg. 22 (general manufactures) and Amdt. 2 to SR 1, Rev. 1, under CPR 30 (machinery and allied products).

Oil Projects to Get Steel Pipe

Allocations of 271,751 tons of steel pipe have been made to carry on third quarter expansion work on oil transportation facilities.

Lion's share of this distribution goes to 23 major projects which are rushing construction work, hoping for completion by end of 1952. They are allowed 227,285 tons on line pipe.

Further division is made to provide 101,000 tons for 12 crude oil pipeline projects. Remainder is to be given to 11 oil products pipeline projects.

A large number of smaller projects, not only crude and products lines, but terminals, small jobs and MRO, will divide up the remaining 44,666 tons of pipe allowed for the quarter.

Die Casters Get Price Increase

Producers of die castings may increase their ceiling prices by 4 pct on the basis of Amendment 6 to Ceiling Price Reg. 60, effective Apr. 29.

This increase can be applied to higher ceiling prices for castings as authorized in an earlier Office of Price Stabilization action, Amdt. 5, dated Feb. 29.

Desirable savings in nickel and other critical materials can be accomplished through new methods in design and construction of industrial furnaces by The Gas Machinery Company.

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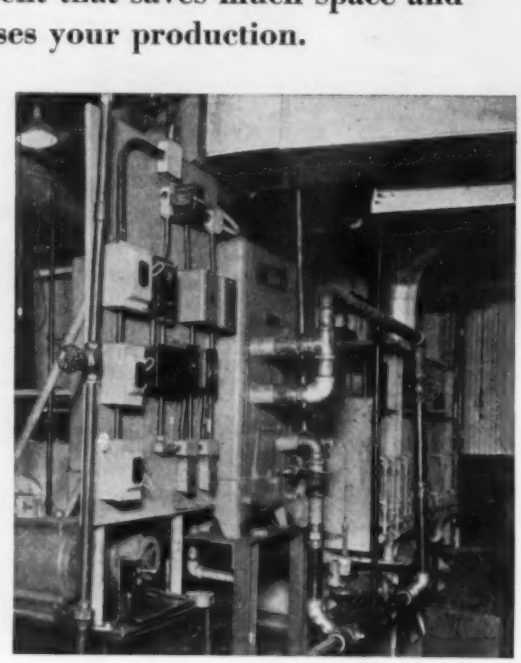

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Columbium Rods for Welding

Columbium and tantalum controls have been modified to permit columbium content rods for welding certain types of nickel-bearing stainless steels and nonferrous nickel-base alloys.

Amendment of Sched. 5 to M-80 now permits users of low carbon (0.03 maximum) austenitic stainless or austenitic steels stabilized with columbium, tantalum or titanium to use columbium content rods for welding such steel.

Hike Aluminum Order Acceptance

Official recognition of the increasing aluminum supply was given last week by an order which permits producers to accept orders equal to 125 pct of their authorized production schedules, including backlog.

Previously, permitted acceptance was 100 pct exclusive of backlogs. The amendment to M-5 applies alike to primary producers, independent fabricators, and secondary smelters.

Oil Pipe Controls Eased by PAD

Revising its allocation policy for the third quarter, Petroleum Administration for Defense will throw open field stocks of oil country tubular goods to all operators who drill 19 or fewer wells a year.

Previously, these field stocks had been held exclusively for cashing tickets held by drillers of less than eight holes a year and operators requiring less than 50 tons a quarter.

Materials Asked for Million Cars

Defense Transport Administration has asked that sufficient materials be made available during the fourth quarter to permit production of 1,150,000 passenger automobiles.

At the same time, the agency asked materials for 290,000 trucks and truck tractors; 110,000 truck bodies; 16,000 truck trailers; and 2200 buses.

Bar Controls Will Be Retained

Regardless of how soon steel production is resumed, National Production Authority says that for the next few months it will continue use of production directives, requiring specific tonnage set-asides of hot rolled carbon bars and semi-finished items of shell and fuze quality steel, to assure meeting military needs.

Third quarter requirements are seen as not likely to be less than those for the second quarter, it is estimated.

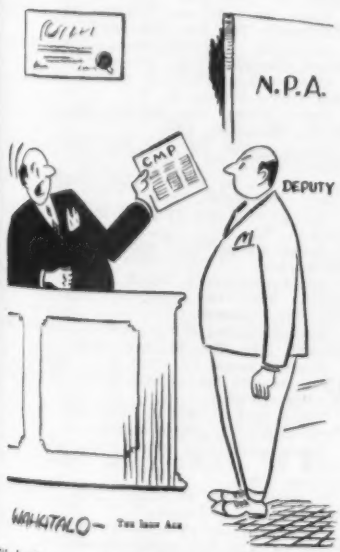
The supply of projectile body steel had been easing prior to calling of the strike. And, officials said, all indications were that the situation would have improved.

But the government is not convinced that steel expansion plans have adequately provided for high military consumption in this respect. National Production Authority still is urging that two additional 14-in. bar mills be added to present plans.

GR-S Rubber Prices Cut by RFC

Prices on GR-S synthetic rubber sold by Reconstruction Finance Corp. are 3¢ per lb lower, on average, following a new Office of Price Stabilization action.

Reductions were specified in Amendment 2, Supplementary Reg. 57, General Ceiling Price Reg., effective May 6.



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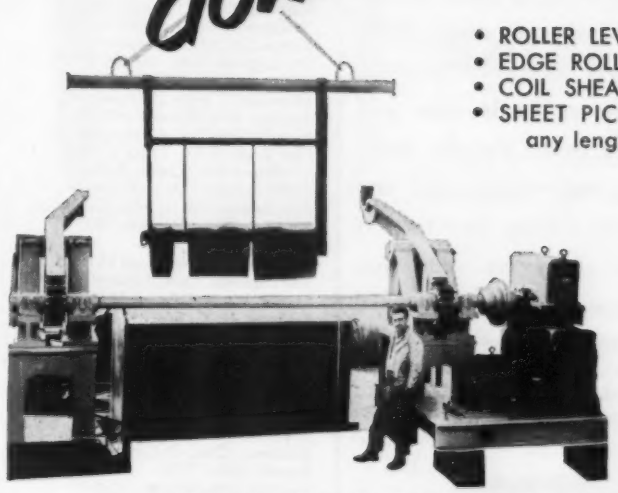

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• You'll talk to a *tool man* when you get your Snap-on branch on the wire. He'll understand your wants clearly, and help you select the most efficient tools for your needs. You'll get professional tools of the finest character — properly designed, strong, versatile, *safe,* Snap-on Tools—that will serve you long and well. For 30 years, plants—large and small—have used and endorsed this "time-saving way to buy time-saving tools." May we send you copies of the latest Snap-on Industrial and General Catalogs? Write—

SNAP-ON TOOLS CORPORATION
8132-E 28th Ave., Kenosha, Wis.

FACTORY BRANCH WAREHOUSES AT 42 INDUSTRIAL CENTERS

Albany, N. Y., ALbany 4-2971
Atlanta, Ga., LAmar 4031
Baltimore, Md., HOpkins 4666
Boston, Mass., STadium 2-2230
Brooklyn, N. Y., SLocum 6-8707
Buffalo, N. Y., GArfield 6374
Charlotte, N. C., 3-8831
Chicago, Ill., TAylor 9-2651
Cincinnati, Ohio, WOodburn 3188
Cleveland, Ohio, PRospect 4400
Dallas, Texas, RIverside 1611
Denver, Colo., ALpine 5406-07
Detroit, Mich., TRinity 5-6455
Fargo, N. Dakota, 5790
Houston, Texas, FAirfax 2815
Indianapolis, Ind., LIncoln 4351
Jacksonville, Fla., 4-4460, 4-4469
Kansas City, Mo., WEstport 0364
Los Angeles, Calif., DUnkirk 83445
Milwaukee, Wis., WEst 3-3116-17
Minneapolis, Minn., GEneva 5367
Newark, N. J., ESsex 5-3197-98
New Orleans, La., RAymond 2418
New York, N. Y., JErome 7-7523
Oklahoma City, Okla., 3-4975
Omaha, Nebr., JAckson 6159
Philadelphia, Pa., POplar 5-7400-01
Pittsburgh, Pa., MOntrose 7600
Richmond, Va., 5-8115
St. Louis, Mo., NEwstead 1150-51
San Francisco, Calif., UNderhill 3-3195
Seattle, Wash., CApitol 3646
Syracuse, N. Y., 5-2224
Toledo, Ohio, ADams 1026

IN CANADA

Edmonton, Alta., 23889
London, Ont., 4-7307
Moncton, N. B., 2-4159
Montreal, Que., DOllard 4620-29
Regina, Sask., 7170
Toronto, Ont., MAyfair 1196-97
Vancouver, B. C., TAtlow 1561
Winnipeg, Man., 927-707

Foremost IN HAND TOOL ENGINEERING, MANUFACTURE, DISTRIBUTION

—Defense Contracts—

Contracts Reported Last Week

Including description, quantity, dollar value, contractor and address:

Spare parts for special purpose equipt, var, $74,279, Century Machine Co., Cincinnati.

Spare parts for materials handling equipt, var, $56,873, Continental Motors Corp., Muskegon, Mich.

Spare parts for materials handling equipt, var, $172,773, The Buda Co., Harvey, Ill.

Heads, 2790 ea, $35,778, Walter Kidde & Co., Inc., Belleville, N. J.

Valves, 2080 ea, $29,760, Manning Maxwell & Moore, Inc., Watertown, Mass.

Tubes, heat exchanger, 164625 lb., $98,940, Phelps Dodge Copper Products Corp., N. Y.

Files, 237912, $80,922, Heller Brothers Co., Newcomerstown, Ohio.

Replenishment of other motor vehicle parts, 92100, $1,254,201, GMC, Pontiac, Mich.

Replenishment of other motor vehicle parts, 18000 ea, $101,700, Trainor National Spring Co., Newcastle, Ind.

Replenishment of other motor vehicle parts, 94500 ea, $25,350, Chrysler Corp., Detroit.

Replenishment of other motor vehicle parts, 3180 ea, $33,017, Gar Wood Industries, Inc., Wayne, Mich.

Replenishment of other motor vehicle parts, 4090 ea, $26,358, Ward LaFrance Truck Corp., Elmira, N. Y.

Replenishment of other motor vehicle parts, 300 ea, $45,653, Bendix Westinghouse Auto., Air Brake, Elyria, Ohio.

Replenishment of other motor vehicle parts, 8500 ea, $47,430, Northwestern Auto Parts, Minneapolis.

Replenishment of hardware, 1100 ea, $29,711, SKF Industries, Inc., Philadelphia.

Maintenance parts for V-17 truck, 1 lot, $324,475, J. H. Holan Corp., Cleveland.

Teletypwriter, 1618 ea, $3,688,392, Teletype Corp., Chicago.

Switchboard, 4000 ea, $3,312,071, The North Electric Mfg. Co., Galion, Ohio.

Truck assembly, $90,000, Hammond Mfg. Corp., Pasadena, Calif.

Generators, 654 ea, $275,785, Westinghouse Electric Co., Dayton.

Ball bearings, $33,927, General Motors Corp., Bristol, Conn.

Aircraft hardware, $98,486, Goodyear Tire & Rubber Co., Akron, Ohio.

Diesel generator sets, 20 ea, $396,610, Caterpillar Tractor Co., Peoria, Ill.

Ball bearings, $74,243, New General Motors Corp., Bristol, Conn.

Shell, 155 MM, 484400, $9,490,344, U. S. Hoffman Mach. Corp., New York.

Fuze, PD, M48A3, 100000, $207,480, Easy Washing Machine Corp., Syracuse.

Portable hydraulic test stand, 101 ea, $284,955, Greer Hydraulics, Inc., Brooklyn.

Regulator assy., 275 ea, $203,416, Airesearch Mfg. Co., Los Angeles.

Connectors, wire rope, 25275 ea, $185,120, Electroline Co., c/o F. R. Hoyt Co., Philadelphia.

Lock assy, 55 ea, $48,973, The Cleveland Pneumatic Tool Co., Cleveland.

Actuator, wing fold, 32 ea, $47,408, Westinghouse Electric Corp., Philadelphia.

Cam, polished, 9435 ea $44,208, Bendix Aviation Corp., Sidney, N. Y.

Spare parts, var, $25,635, Hughes Keenan Corp., Mansfield, Ohio.

Spare parts, var, $44,862, The Foote Co., Nunda, N. Y.

Spare parts, var, $27,349, Hughes Keenan Corp., Mansfield, Ohio.

Spare parts, var, $179,598, Barber Greene Co., Aurora, Ill.

Spare parts, var, $29,334, Koehring Co., Milwaukee.

Replenishment of tank & combat vehicle parts, 3950 ea, $201,845, American Steel Foundry, Chicago.

Replenishment of hardware, 8559 ea, $402,061, Hi-Mill Mfg. Co., Milford, Mich.

Replenishment of other motor vehicle parts, 12550 ea, $66,222, Austin Trailer Equipt. Co., Muskegon, Mich.

Truck pickup, 956 ea, 1182 sets, $1,115,662, Ford Motor Co., Washington.

Replenishment of other motor vehicle parts, 39916 ea, $373,657, Hercules Motors Corp., Canton, Ohio.

Replenishment of tools, 11535 ea, $229,902, Dockson Corp., Detroit.

Replenishment of other motor vehicle parts, 37300 ea, $158,528, GMC, Detroit.

Replenishment of tools, 2000 ea, $246,960, Amer. Chain, York, Pa.

Replenishment of other motor vehicle parts, 13920 ea, $236,705, Dana Corp., Toledo.

Replenishment of other motor vehicle parts, 1000 ea, $104,640, The Gear Grinding Mach. Co., Detroit.
Replenishment of other motor vehicle parts, 11700 ea, $277,415, GMC, Pontiac, Mich.
Cartridge, tracer, cal. .30, 3663000 rds, $384,-854, Olin Industries, Inc., East Alton, Ill.

Government Inviting Bids

Latest proposed Federal procurements, listed by item, quantity, invitation No. or proposal and opening date. (Invitations for Bid numbers are followed by "B," requests for proposals or quotations by "Q.")

Chicago Quartermaster Depot, Chicago.
Can corrugated nesting galvanized, 100000 ea, 52-1424B, May 14.

Ordnance Tank Automotive Center, Detroit.
Bearing needle, 203600, 52-3429B, May 13.
Bearing roller, 93600, 52-3430B, May 13.
Term battery cable, 42000, 52-3239B, May 13.
Impeller assy eng fuel pump, 500, 52-3298B, May 13.
Strnr filter element, 18000, 52-3298B, May 13.
Head fuel filter, 1500, 52-3298B, May 13.
Gun cleaning, 15000, 52-3412B, May 13.
Bearing, 3000, 52-3380B, May 13.
Gear, 500, 52-3380B, May 13.
Gear idler air comp, 1000, 52-3380B, May 13.
Strnr cyl block, 50000, 52-3380B, May 13.
Clip, 10500, 52-3383B, May 13.
Pump eng fuel, 400, 52-3418B, May 23.
Arm rocker, 1000, 52-3418B, May 23.
Tank fuel, 100, 52-3398B, May 23.
Cone tapered roller bearing, 1900, 52-3434B, May 13.
Strainer fuel tank, 8000, 52-3336B, May 19.
Absorber shock, 150000, 52-3311B, May 8.
Torch oxyacetylene, 13000, 52-3237B, May 9.
Gear set, 1200, 52-3342B, May 20.
Gage, 800, 52-3375B, May 12.
Gage combination oil pressure, 250, 52-3375B, May 12.
Fan, 36000, 52-3366B, May 12.
Shaft propeller, 6000, 52-3341B, May 21.
Shaft, 9600, 52-3341B, May 21.
Bearing, 26900, 52-3345B, May 12.

N. Y. Quartermaster, N. Y.
Machine, shoe repair, 130 ea, 52-1606B, May 23.

Corps of Engineers, Philadelphia.
Mower lawn, 946, Eng-36-109, 52-427B, May 6.
Bracket fire extinguisher, 1500, Eng-36-109-52-175B, Apr. 29.
Pump centrifugal, 320, Eng-36-109-52-385B, May 1.

Corps of Engineers, Pittsburgh.
Motor outboard, 207 ea, Eng-36-058-52-141B, May 19.

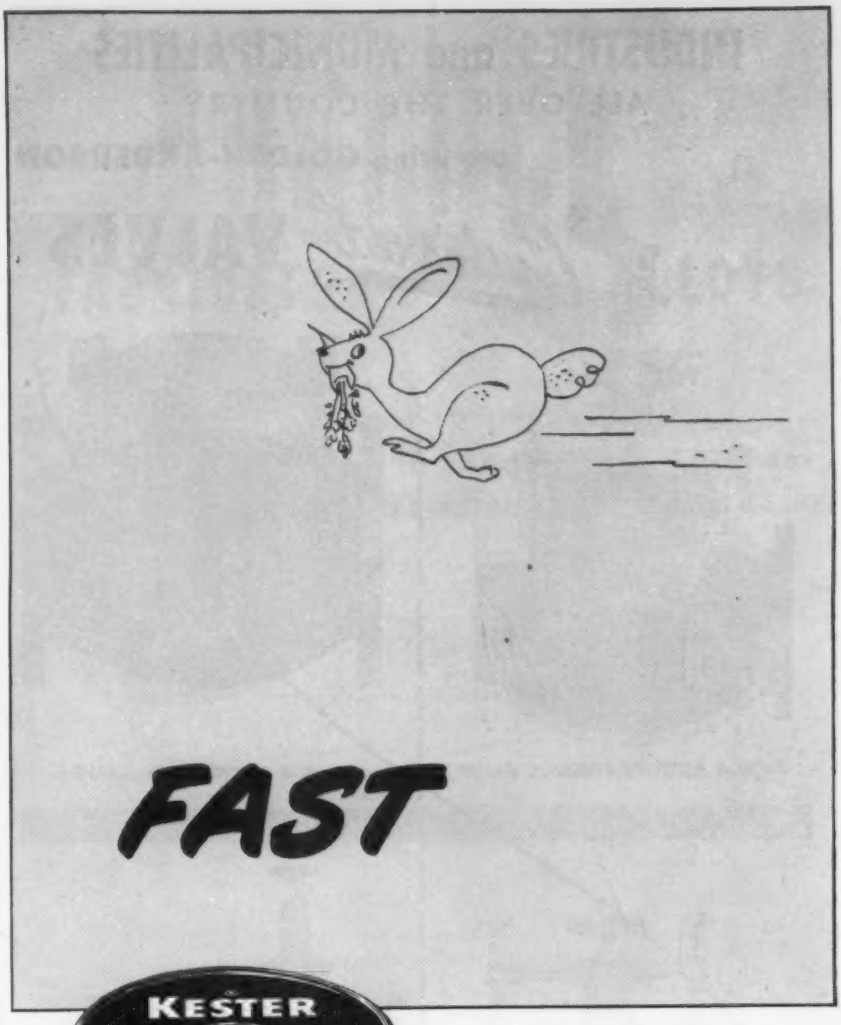
Corps of Engineers, Chicago.
Drill pneu, 110 ea, B-367B, May 22.
Hoe pile driving, steel, 8145 ea, B-366B, May 22.
Tractor, 20 ea, A-369B, Apr. 28.
Sprayer, paint, 279 ea, B-368B, May 21.

Navy Purchasing Office, Washington.
Trucks pallet, 100, 6492B, May 16.
Tool sets, 2500 sets, 3920Q, May 26.
Indicators test, 14920, 3933Q, May 21.
Pullers bearing, 2424, 3950Q, May 22.
Punches center, 145260, 6509B, May 23.
Tools flaring copper, 4500, 6510B, May 19.

Signal Corps, Philadelphia.
Shield tube steel, 300 ea, 1289-25B, May 13.

Watervliet Arsenal, Watervliet, N. Y.
Steel muzzle brakes part for 90 MM gun, 500-1420 ea, 31714Q, May 21.
Steel brass crank elevating screw assembly for 60 MM mortar, 4410 ea, 52-147B, May 21.
Steel extractor assembly part for 30 MM gun, 7000 ea, 52-147B, May 21.

General Stores Supply Office, Philadelphia.
Sprayer, paint, 279 ea, B-368B, May 21.



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FAST In Soldering Action
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Kester can give you the exact percentage of flux content needed for your particular soldering operation. Only Kester has the proven ability to exercise this *flux control!*

Kester also has the greatest selection of Flux-Core Solders . . . Acid, "A", Nosput, Knorust, Plastic Rosin, "Resin-Five", "44" Resin and others in a wide range of diameters and impurity free alloys.

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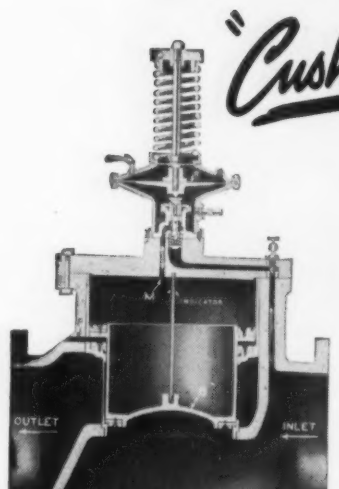
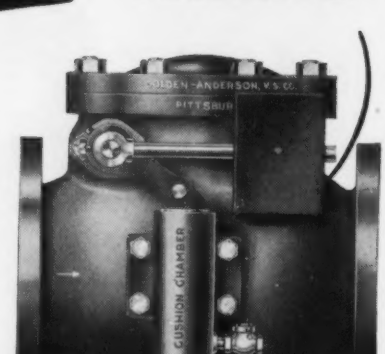
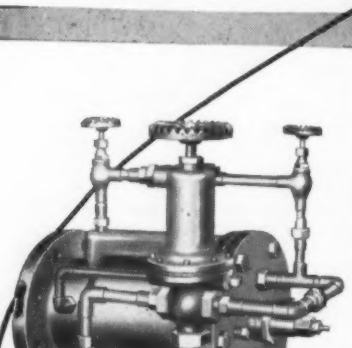
"Cushioned" VALVES



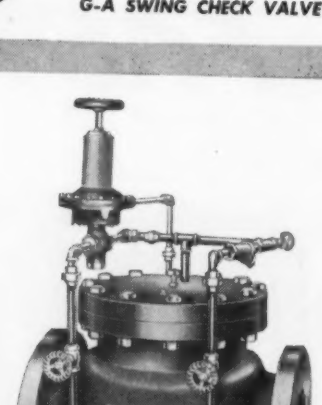
G-A ALTITUDE CONTROL VALVE



G-A SWING CHECK VALVE



G-A SURGE RELIEF VALVE



G-A WATER PRESSURE REDUCING VALVE

for **DEPENDABLE, LOW COST OPERATION**

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These Golden-Anderson cushioned automatic valves are specifically designed for use in water works systems. Our experienced engineers will be glad to work with you on your pressure control problems. Write us today—no obligation.

Technical bulletins available on request.

IMMEDIATE SHIPMENT FROM STOCK ON MANY SIZES.

GOLDEN ANDERSON Valve Specialty Company

2096 KEENAN BUILDING ★ PITTSBURGH 22, PA.

Steel Inquiries and Awards

Fabricated steel awards this week include the following:

4000 Tons, Birdsboro, Pa., foundry and heat treatment building for Birdsboro Steel Foundry, to Harris Structural Steel Co., New York.

3390 Tons, Boston, furnishing, erecting and painting steel superstructure of John F. Fitzgerald Expressway, Bethlehem Steel Co., Bethlehem, Pa., low bidder.

1138 Tons, Chicago, Pharmacy Building, University of Illinois to Wendnagle & Co.

580 Tons, Waukegan, Ill., Johnson Motors, to Milwaukee Bridge Co.

405 Tons, Iron River, Mich., to Hannah Iron Building, to C. Heinecke.

330 Tons, Chicago, transmission tower, Commonwealth Edison Co., to Blaw-Knox.

Fabricated steel inquiries this week include the following:

6935 Tons, Boston, John F. Fitzgerald Expressway, section of North St. to Oliver St., steel superstructure, elevated highway. (6935 tons includes structural carbon and silicon steel for bents and structural carbon steel for floor system and bracing.)

3662 Tons, Boston, Mass., another section of John F. Fitzgerald Expressway between Commerce St. and Oliver St., steel superstructure, elevated highway. This includes structural carbon steel for bents, floor system and bracing, and structural silicon steel for bents.

3339 Tons, Boston, Mass., steel superstructure for John F. Fitzgerald Expressway (elevated structure) from Commerce St. to Oliver St. in downtown Boston.

2700 Tons, Easton, Pa., main hospital building, Easton Psychiatric Institute, bids due May 14.

2500 Tons, Tobyhanna, Pa., buildings, utilities, etc., Tobyhanna Signal Depot, U. S. Army Corps of Engineers, additional 6000 tons to be furnished by government and erected by contractor, bids due May 23.

300 Tons, Frankford, Pa., Building No. 44, Frankford Arsenal, U. S. Army Corps of Engineers, bids due May 8.

240 Tons, Salem County, N. J., Hancocks Bridge, New Jersey State Highway Dept., bids due May 20.

March shipments of fabricated structural steel, according to reports compiled by the American Institute of Steel Construction, amounted to 271,085 tons, an increase of 10% over the previous month's 246,398 tons. The first quarter of 1952 totaled 762,430 tons, greater by some 18% than the corresponding period of 1951.

Bookings for March were 222,624 tons, off slightly from February and a drop of 25% from the same month of last year when 297,517 tons were reported. The first three months of this year totaled 666,566 tons, a decrease of 27% from the like period of 1951, but up 24% over the same period during the average four years 1947/1950 when 535,549 tons were booked.

A tabulation showing the detailed figures for three months is given below:

	Estimated Total Tonnage for the entire industry		
CONTRACTS CLOSED	1952	1951	Avg. 1947-1950
Total Tonnage			
January	213,110*	361,373	161,9[illegible]
February	230,832*	[illegible]	[illegible]
March	222,624	297,517	221,3[illegible]
Totals	666,566	915,636	535,5[illegible]
SHIPMENTS			
January	244,947*	214,000	166,9[illegible]
February	246,398*	193,638	161,1[illegible]
March	271,085	237,087	191,2[illegible]
Totals	762,430	644,725	519,3[illegible]
TONNAGE OF BACKLOG	2,500,946	2,602,386	1,199,0[illegible]
Percentage scheduled for production within the next four months (To July 31)	46%	42%	53%
Percentage scheduled for production after the next four months (From Aug. 1)	54%	58%	47%

*Revised

Ships:

Navy awards contracts for small vessels to eight shipbuilders.

Construction of 167 small vessels and barges for military use is being handled by eight companies, five of them small businesses.

Total value of contracts calling for this work is more than $15 million. The small craft are being bought through Navy Bureau of Ships for the Army and Air Force.

Companies receiving contracts, and types of vessels they will furnish are:

Builders—National Steel and Shipbuilding Co., San Diego, 45-ft and 100-ft tugs, and 65-ft cargo-passenger craft.

Higgins, Inc., New Orleans, 100-ft tugs and 65-ft cargo-passenger vessels.

Roamer Boat Co., Holland, Mich., 45-ft tugs.

John E. Matton and Sons, Inc., Waterford, N. Y., 100-ft tugs.

Fellows and Stewart, Inc., Wilmington, Calif., 65-ft tugs.

Smith's Basin and Drydock Co., Ft. Lauderdale, Fla., 65-ft tugs.

Marine Steel Fabricators, Newport Beach, Calif., 45-ft barges.

Weaver Iron Works, Inc., Dallas, 45-ft barges.

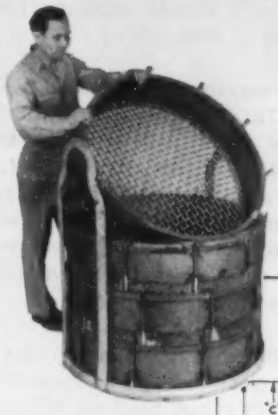
March Building Contracts Rise

Construction contracts for states East of the Rockies rose in March over February levels, according to F. W. Dodge Corp. March awards of $1,321,254,000 were 49 pct higher than the month previous and 4 pct above those of a year ago. But total of first 3 months of '52 was 10 pct under the same period last year—$3,108,551,000 against $3,451,225,000.

March non-residential awards of $463,276,000 were 54 pct higher than in February but 1 pct lower than March, 1951. Residential contracts at $592,717,000 were 50 pct over the month before and 3 pct over the year before. Public and private works and utilities totaled $265,261,000 or 42 pct more than February.

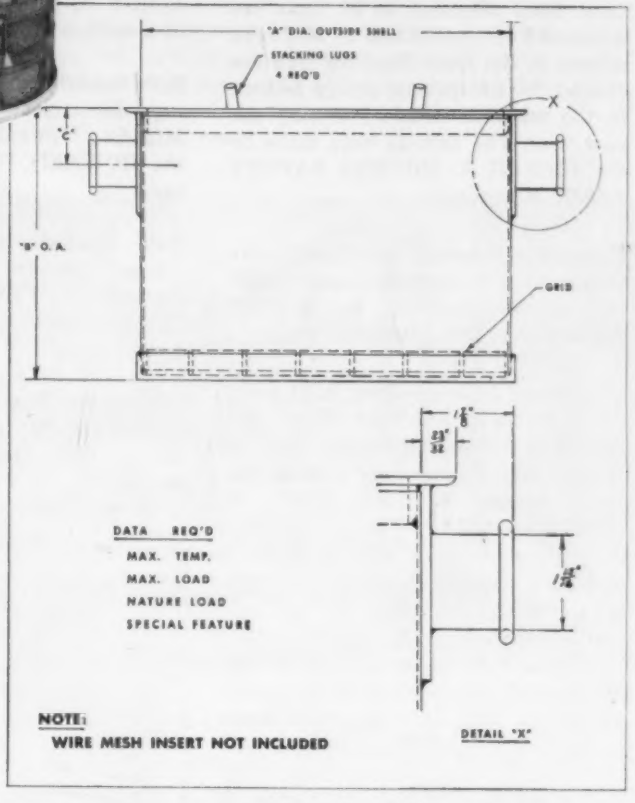
ROLOCK

FABRICATED ALLOYS



A Cost-saving method to inquire for...or order...

PIT TYPE FURNACE STACKING BASKETS



Rolock standardized type, fully fabricated-welded alloy baskets are handled as a group, nesting in a pick-up sling. The principal design feature is in the very high live-dead load ratio . . . one answer to greater service life.

Usual construction employs a fabricated grid (see drawing) but wire mesh, as shown above, may be used. Assemblies to fit standard or existing vertical furnaces can be supplied to your specifications. Use the drawing for quotes or orders.

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Offices in: PHILADELPHIA • CLEVELAND • DETROIT • HOUSTON • INDIANAPOLIS • CHICAGO • ST. LOUIS • LOS ANGELES • MINNEAPOLIS • PITTSBURGH

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JOB-ENGINEERED for better work
Easier Operation, Lower Cost

SRL52

Industrial Briefs

New Building—INDUSTRIAL NUCLEONICS CORP., Columbus, Ohio, has completed a new research and engineering building. It will contain the firm's radio-chemistry department.

Loading Dock—A new coal barge loading dock will be built for Powhatan Mining Co., by The Contracting Div. of DRAVO CORP., Dilles Bottom, Ohio.

Safety Awards—Certificates of Honor have been awarded to 37 iron ore mines and companies and 27 Michigan miners in the Lake Superior iron ore district for exceptional safety records in the minerals industry during the past year. The awards were made by the JOSEPH A. HOLMES SAFETY ASSN., Minneapolis.

Expansion Program — Ground was broken for a new research and chemical hydride building by METAL HYDRIDES, INC., Beverly, Mass.

New Name Address—John B. Stevens, Inc., formerly of New York, has moved its offices and headquarters to Somersville, Conn. Firm's name has been changed to THE JOHN B. STEVENS CO.

Appoints Representative — MICHIGAN TOOL CO., Detroit, has appointed the Oliver H. VanHorn Co., Inc., New Orleans, as Louisiana and Mississippi representatives for gear production and checking equipment and gear cutting tools.

Buy Equipment—Equipment for manufacturing insect wire screening formerly owned and operated by the Woven Wire Fabrics Div., John A. Roebling's Sons Co., N. J., has been purchased by ALUMINUM CO. OF AMERICA, Pittsburgh.

Thermistor Facts — The Carboloy Dept. of GENERAL ELECTRIC CO. has issued a new catalog describing Carboloy thermistors. Typical thermistor applications and wiring diagrams are listed, and also contains basic information relating to physical and operating of thermistors, which are electronic semi-conductor control elements responding to minute temperature changes.

Building's Up—A new building has just been completed in Mt. Vernon, N. Y., by CONSOLIDATED TUBE CORP. It will double capacity for warehousing of steel tubing.

Removal Program — TENNESSEE COAL & IRON DIV., U. S. Steel Corp., New York, is preparing to spend nearly a half million dollars to remove silt deposits that are filling its large reservoir near Birmingham, Ala. The company plans to remove 570,000 cu yd of sediment by means of a suction dredge.

Sells Department—The precision casting department of Allis-Chalmers Mfg. Co., Milwaukee, has been sold to the HOWARD FOUNDRY CO., Chicago.

New Pipeline—Initial operations of its new 30-inch pipeline have been started by TEXAS EASTERN TRANSMISSION CORP., Shreveport, La.

Distributor Named — WARNER ELECTRIC BRAKE & CLUTCH CO., Beloit, Wis., has named the Wheel Service Co., St. Paul, Minn., as a midwestern distributor.

BIG BITE: Each bucket of this coal barge unloader built by Heyl & Patterson, Inc., takes a half-ton bite out of a barge at Jones & Laughlin Steel Corp's Aliquippa plant.

Experiment Described—Dr. J. B. Austin, of U. S. STEEL's Kearny, N. J., Laboratory, told Southern industrialists attending a research seminar in Birmingham, Ala., that experiments now being made with a turbo-hearth promise a method of refining steel in 10 min. It may be comparable in quality with steel produced in 10 hrs in a conventional open hearth furnace. If the turbo-hearth proves practical and economical, as is now indicated, its use will be advantageous in refining ores high in phosphorus, he said.

Training Offered—Apprentice training to qualify as jet engine metalsmiths will be offered young men by PRATT & WHITNEY AIRCRAFT, East Hartford, Conn. Applicants must be between 18 and 21 years of age and have a high school or technical trade school diploma or an equivalent education.

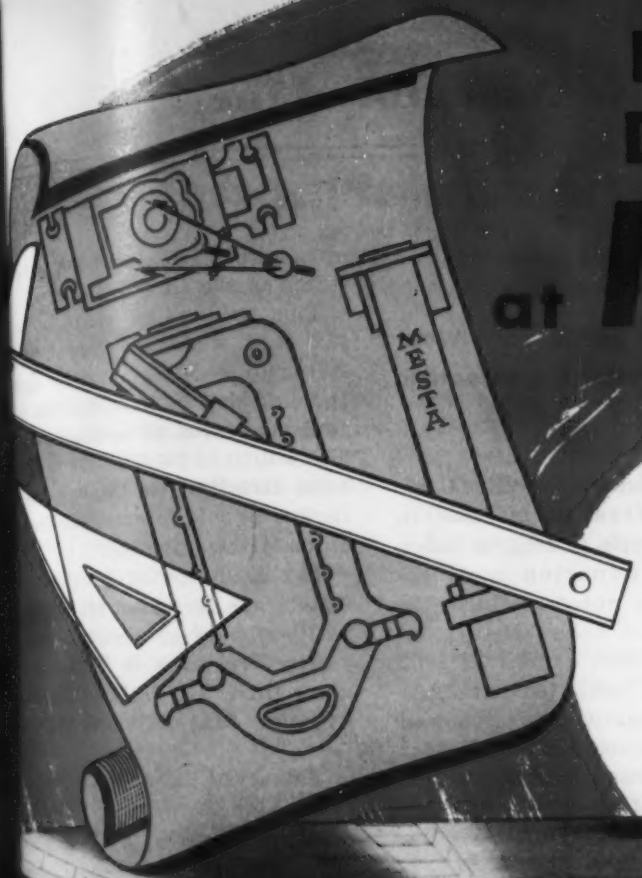
Rapid Expansion—G. M. GIANNINI & CO., INC., Pasadena, Calif., manufacturers of high-precision testing instruments for aircraft and guided missiles, nearly tripled production in 1951. By the end of 1952 capacity of its six locations in Pasadena and one in Springfield, N. J., will be increased 150 pct by additional headquarters and production plant in Pasadena and acquisition of a factory in East Orange, N. J.

Changes Name — Latrobe Electric Steel Co., Latrobe, Penn., has changed its name to LATROBE STEEL CO.

Debut Demonstration—A hillside was leveled to form a playing field for a school in Australia as a demonstration of what four new types of locally-made earth moving machinery could do. The machines were made at the Sydney plant of LE TOURNEAU (Australia). Two of the four, a bulldozer and a hauling unit, are electrically controlled. Le Tourneau claims the machines are the most powerful yet made by that company there.

New Plant — SOUTHERN METAL TREATMENT CO., Birmingham, Ala., is building a new plant that will consolidate operations of two smaller plants. The new plant will be large enough to provide for further expansion, if needed.

ENGINEERING DEPARTMENTS at MESTA



A section in one of the Mesta Engineering Departments, where machinery to fit individual requirements is designed and plans for complete plant projects are developed. These include not only designs for the mechanical equipment built by Mesta, but also for buildings, foundations, electrical distribution systems, and all the engineering that is required for the creation of a modern industrial plant.

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

Auto Financial Reports Gloomy

Earnings, sales, dividends down in first period . . . Woes of 1952 show in balance sheets . . . Chrysler the exception, with profit gain despite sales drop — *By R. D. Raddant.*

Automotive industrialists, who have had nothing but a series of headaches since the start of 1952, passed the aspirin bottle to stockholders with first quarter financial reports. Earnings, sales, and dividends are way down.

The industry was beset from the first of the year with insurmountable difficulties. Production quotas were cut back severely. Defense orders were slow and conversion difficult. When production figures were raised to respectable figures, a stubborn buyers' resistance developed that would not thaw with the warm spring weather.

Hopes for favorable returns in the spring and summer months were severely shaken by the sudden steel strike. A steel stoppage of any length would have hit at the worst possible time when production was scheduled to be highest and sales most vigorous.

Bad News—But even before the strike, the bad news on dividends came with quarterly reports, General Motors sales were 8.5 pct below those of the first quarter for 1951. Hudson reported that per share earnings dropped from $1.32 a year ago to $1.10. Packard indicated that share earnings would be less than the 17¢ reported a year ago. Nash earnings were under 50¢.

An exception was Chrysler Corp. which reported an increase in earnings despite a drop in sales. Improved production costs accounted for a substantial rise in net income on sales. Return on sales for the first quarter of 1952 was 3.24 pct compared with 2.31 pct a year ago. Chrysler showed net earnings of $18,793,677 for the quarter, more than $5 million higher than the same period in 1951, although the company's sales dropped 27 pct.

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS	TOTAL
May 3, 1952	101,593*	28,515*	130,108*
Apr. 26, 1952	104,160	29,970	134,130
May 5, 1951	122,365	32,158	154,523
Apr. 28, 1951	125,978	36,762	162,740

*Estimated

Source: *Ward's Reports*

Sales Down — The Automobile Manufacturers Assn. reported that first quarter sales in 1952 totaled 1,293,599 vehicles, 35 pct, or 686,577 units, below the first quarter of 1951. March factory sales exceeded February by 11 pct, but fell far behind March, 1951.

The R. L. Polk Co. estimated that first quarter new car registrations in 1952 would be the lowest for any January, February, and March since 1949. A decline which started in May, 1951, has continued through each month, with but one exception. March sales of 330,000 were higher than the previous month, but far lower than the 512,599 vehicles sold a year ago.

Taxpayer — The horseless carriage is indirectly responsible for one-eighth of all tax revenue collected in the United States.

This astounding share of the tax load was uncovered by the Automobile Manufacturers Assn. It found that in 1950, the most recent year with all available data, $7.5 billion of $60.8 billion in taxes came directly from the use, manufacture or sale of motor vehicles or automotive equipment.

Tax load carried by the automobile has increased steadily and will probably go higher. Special automotive taxes in 1951 totaled more than $4.5 billion compared with only $924 million in 1930.

"Luxury" Tax—Federal excise taxes alone brought $1.5 billion into U. S. coffers in 1951. These were originally imposed as luxury taxes along with whiskey, mink coats, and diamond bracelets. Cars and trucks are now frequently considered working tools, but the taxes continue.

Of the car itself, 31 pct of the purchase price represents taxes. The breakdown on a $2000 car shows that $155 goes into manufacturers' taxes, $154 to suppliers' taxes, $102 dealers' taxes, $57 average sales tax, and $146 Federal excise tax.

No Tire Cuts—Don't look for cheaper automobile tires in the near future.

In a special letter to its dealers, B. F. Goodrich Co. advised that there is no hope for price reductions. The company pointed out that replacement tire prices, established in 1950, have remained unchanged although every major item of tire cost, except crude rubber, is at as high or higher level.

Crude rubber, the only item to take a cost drop, is no longer a major factor in determining costs except in large-size truck tires. Passenger car tires contain 75 pct to 85 pct American-made rubber with a low percentage of crude, or tree rubber.

TANKS: Orders, Production Grow

Auto companies report good progress on government work... Army triples order for T-48 tanks from Ford . . . First engines shipped from Chrysler . . . Tool shortage hurts output.

Tank contracts undertaken by automobile companies appear to be progressing satisfactorily. Government orders are multiplying. Production is on schedule.

Ford announced last week that Army Ordnance had more than tripled its order for T-48 medium tanks that will be built at the company's new plant under construction West of Detroit.

Ford reported that the effects of a fire that damaged a part of the plant Feb. 29 had been overcome without effect on delivery schedules. Production will be well under way before the end of the year, company spokesmen promised.

The original Ford contract of $180 million included costs for tooling the new plant. New orders raised the order volume to more than $300 million.

First Engines—At the same time, Chrysler Corp. shipped its first tank engines from the Michoud Ordnance plant in Louisiana, less than 11 months after Chrysler began rehabilitation of the former aircraft plant.

First shipment was headed to the Chrysler heavy tank plant at Newark, Del.

R. S. Bright, general manager of the Tank Engine Div., said that operations were handicapped by a shortage of critical machines. First phase of the operations was accomplished with the aid of tool room machines and temporary equipment.

Auto Payment Time Rise Expected

The National Automobile Dealers Assn. confidently predicts that Regulation W will be modified to permit a 24-month time period for payment on an automobile.

Regulation W has been the target of dealers for months. They have argued that at present buying prices the average motorist is hard pressed to make payments over 18 months. Confronted by faltering sales, the dealers have hammered away at the regulation until relief may be in sight.

Strike:

Automakers caught off balance but with fairly good stocks.

Quick execution of the steel strike order caught the auto industry off balance but in comparatively good condition to ride out what became a short strike.

Most companies had scheduled high production for the next few months. The strike found inventories in better shape than might be expected when inventories are controlled. On the other side of the balance sheet, the first brief shutdown that preceded government seizure had shortened supply of some products.

A stoppage would have been felt first by suppliers of the several thousand parts that make up a modern automobile. Many of these suppliers purchase their steel from warehouses as they need it. Obviously, a number were caught with their inventories down.

Key Men—Most companies had inventories to keep their big operations, stamping and forging, for example, going for some time. Company spokesmen without exception put the finger on parts suppliers as the key to maintaining production during a long strike.

Effect is compounded as the supply pipelines are emptied. It takes from 2 to 3 weeks to resume production after settlement of a strike, as steel must be manufactured, processed and shipped to the auto plants for use. It takes more time for the plant itself to resume production.

THE BULL OF THE WOODS — By J. R. Williams

LOOK OUT, SENATOR, YOU'LL GET A MOUTHFUL OF ROUND-HOUSE CONFETTI!
IF YOU'LL GIVE ME THAT TOOL A MINUTE I'LL GRIND IT SO IT'LL CUT LIKE A MACHINIST IS RUNNIN' THAT LATHE INSTID OF A GREEN APPRENTICE KID PLAYIN' ON IT!
THAT OL' BOY HAS MADE MANY A REAL MACHINIST OUT OF MANY A FATHEAD BY RUBBIN' INTO 'EM WHAT YOU COULDN'T TEACH 'EM!
5-9
J.R.WILLIAMS
THE PROFESSOR
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It's performance that counts

THE CHAMPION — AVERAGE PRO

He wins when the pressure's on

5'11"	HEIGHT	5'11"
29 yrs.	AGE	29 yrs.
165 lbs.	WEIGHT	165 lbs.
39"	CHEST	39"
7"	WRIST	7"
32"	WAIST	32"

He loses the tough matches

. . . there's more to a "Champion" than the tape measure shows!

HARDTEM DIE BLOCKS . . .

perform like "champions" in the production line

Because they're carefully forged and heat treated by Heppenstall, Hardtem Die Blocks possess exceptional qualities of wear-resistance. Their patented steel analysis resists softening and heat checking in service. Proven in service many times over, the record of Hardtem Die Blocks assures the following benefits for production:

- **LONG LIFE OF DIES**
- **HOLDS TRUE DIMENSIONS**
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- **LOWER OVERALL DIE COST**

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THE SCRAP SITUATION IS TOUGH . . . YOU CAN HELP!

Send all obsolete equipment to your local scrap dealer AT ONCE

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. . . the most dependable name in die blocks, piston rods . . . hammer rams . . . sow blocks

"Secret" Steel Price Offer Admitted

Rumor of $4.50 increase confirmed but Arnall says current top is $3.00 . . . Washington OK on small RFC loans no longer needed . . . Central Supply Dept. plan rapped—*By G. H. Baker.*

Although Washington control officials hotly denied last week they had privately offered steel companies a $4.50-per-ton increase as the price of settling the wage dispute on the basis of the Wage Stabilization Board's recommendations, it's now official that such an offer was made.

Ellis Arnall, price-control boss, had been insisting that $3 per ton was the biggest increase in price the government would allow. But he admitted at the Capitol that the $4.50-per-ton figure was secretly offered on the grapevine recommendation of President Truman, ODM Director Steelman, and Economic Stabilizer Putman.

Resumes Stubborness — When Mr. Arnall was asked how he could justify his current refusal to go above $3 per ton in the light of his earlier recommendation of $4.50 per ton, he said the higher figure was offered on the grounds of "pure expedience," and that "it could not be justified."

From here on, he declares, $3 is the government's top offer as long as he's running the price-control program. But Mr. Arnall has now put himself on record as being able to change his mind.

No Okay Needed—It's now possible to obtain a government loan from any of the 31 regional offices of the Reconstruction Finance Corp. without waiting for Washington approval. The new policy applies to all business loans up to $50,000.

Clearance from the RFC's Washington office now is required only on loans in excess of $50,000, and on applications in which there is some question of eligibility.

Faster processing of loans to small business will result from operation of the new policy, RFC predicts. RFC borrowers still are required to show that proposed loans will contribute to defense needs or will help meet essential civilian requirements.

Defense Seizure Rules—Look for an anti-seizure amendment to be written into the new Defense Production Act. Present plans call for a clear-cut declaration against using any part of the control statute as grounds for seizure of any industry.

Drafting of this ban on indiscriminate seizure by defining specific conditions is known to be under consideration by several key law-makers, including Chairman Maybank, of the Senate Banking Committee—the Senate group authoring the new control law.

Thumbs Down—Plans for transferring all military purchasing to a new and centralized "Dept. of Supply" received an abrupt setback from a civilian group of purchasing experts which had undertaken a study of military procurement at the request of Secretary of the Navy Dan A. Kimball.

"I hope Bess doesn't change her mind."

Creation of any new, single, centralized, so-called fourth military department (Dept. of Supply) would be inadvisable and unnecessary, and probably would compound further the practical problem of purchasing for the services, the experts found.

"Large Enough"—The civilian group reported to Secretary Kimball that the requirements of the Army, Navy, and Air Force, with respect to nearly all items are sufficiently large to secure the maximum in advantageous prices.

Many large firms have found through experience that while centralized purchasing provides some very definite advantages, it is no cure-all. In fact, it has been demonstrated on many occasions that beyond some point in size and operations, the effectiveness of complete centralization is lowered.

Within Congress, however, there still is heavy pressure for establishment of a new military agency which would administer "single-catalog" buying.

Single Catalog—House Armed Services Committee, which has control over all military legislation, is supporting a bill which requires all the military services to prepare their shopping lists from a single supply catalog prepared by a proposed "Defense Supply Management Agency."

The single catalog would replace the 15 separate catalogs now in use. The director of the new agency would report only to the Secretary of Defense.

The committee believes separate buying as now practiced by the Pentagon results in waste, duplication, and competitive buying.

three

In ~~two~~ years' continuous operation on a three-shift basis, these 116 A.O. Smith Heavy Duty AC Welding Machines on this auto frame line have set an amazing record of *dependability in production.* Designed and built for extreme requirements, they have accumulated nearly ~~15,000~~ 23,000 hours per machine—a rugged *in-service* life-test at duty cycles up to 82%!

More than ~~1,000,000~~ 1,500,000 auto frames were built in this period . . . more than ~~4,000,000~~ 6,000,000 pounds of weld metal deposited by the Welding Machines shown here—*without a shutdown* caused by welding equipment failure!

The A. O. Smith Heavy Duty AC Welding Machine has *proved in use* that it will stand up under service which punishes most welding machines. We rely on it to turn out thousands of tough welding jobs—from truck frames to giant pressure vessels.

And you can rely on it for long, trouble-free service, power savings, easy operator acceptance. But *you* be the judge . . . try the welder MADE BY WELDERS *FOR* WELDERS.

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DEFENSE: Output Problems Studied

Newly-created Production Policy Advisory Commission to advise defense agencies on long-range problems . . . Studebaker chairman Harold Vance named director—*By R. M. Stroupe.*

Long-range production problems will be studied and advice on handling them presented to the Defense Secretary by a newly-created Production Policy Advisory Commission, directed by Harold Vance, chairman of the board and president, Studebaker Corp.

Aim of the group, scheduled for its first meeting May 9, is to promote "a maximum of defense production capacity at a minimum cost to the government." The commission will review output plans and expediting procedures, offering recommendations to the Defense Secretary and, where appropriate, to the Munitions Board and Office of Defense Mobilization.

To Be Named— Clay Bedford, executive vice-president of Kaiser-Frazer and until May 2 the Defense Dept. trouble-shooter on production difficulties, is a member of the new group. Remaining members of the 7-man commission will be named shortly.

Special advisor to the commission on machine tool matters is Harry Vollmer, former production vice-president and director of Martin Aircraft. A member of the National Aeronautical Assn., Vollmer has been an advisor to the Defense Secretary.

Charles Stauffacher, ODM staff director, is executive secretary and staff director of the commission. Personnel who have been aiding Bedford in his Defense Dept. role form the commission staff.

Current and projected programs of the Defense Dept. are at the top of the list of topics to be studied.

More Industry Atom Work Planned

Broader areas for industry contributions to the nuclear energy program will be opened up by the new Office of Industrial Development of the Atomic Energy Commission.

Establishment of the office is a forerunner of a time when, according to AEC General Manager M. W. Boyer, industry will be responsible for a "substantial part" of the total program. Mr. Boyer has promised a two-way exchange of information between industry and AEC on development matters.

Head of the Office of Industrial Development is Dr. William Lee Davidson, director of physical research for B. F. Goodrich Co. since 1947. Before joining Goodrich he was with Monsanto Chemical Co. for a year.

Puny Rise in Copper Rations

May allocation total of 104,598 tons of refined copper represents a negligible increase over April but is the next to lowest figure since copper controls were imposed.

Distribution will be as follows:

"Distress contracts, Alvin, old boy, let's look on them, shall we say, as marriage licenses."

Brass mill products, 46,130 tons; wire mill products, 49,468 tons; foundry products, 6000 tons; and exports, 3000 tons.

Copper and copper alloy base alloy scrap allocations were hiked nearly 8000 tons above April to a total of 83,050 tons.

Supplies of refined copper have decreased since February but availability of scrap has steadily increased, National Production Authority reports.

Freight Cars:

DTA starts new program, asks 30,000-unit fourth quarter quota.

Hoping to get enough materials for at least 10,000 units a month, Defense Transport Administration last week kicked off its new freight car program (THE IRON AGE, May 1, p. 96) by demanding fourth quarter allocations sufficient to build 33,000 new units.

Requirements were presented to Defense Production Administration with full approval of National Production Authority's railroad equipment division.

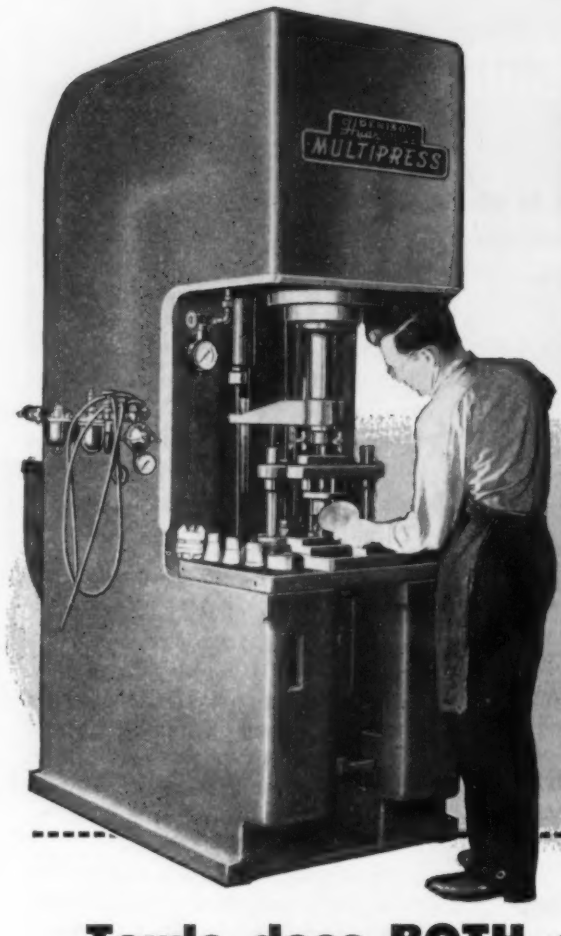
Figure provides only for domestic production and does not take into account any needs for export, military, or industrial use. These had not been agreed upon at the time. But the request did include 2000 tank cars.

Also Needed — Other requirements presented included 1021 locomotives, 125 trolley coaches, 100 rail passenger cars, 75 rapid transit cars, and 25 street cars. These, too, were for domestic use only.

Rail needs for fourth quarter were set at 450,000 tons. Requested third quarter allocation was for 400,000 tons, which DPA later trimmed to 387,000.

Less than 450,000 tons would be insufficient to meet immediate needs, DPA has been told.

Industry has also requested a change in present ordering procedure—asking that it be permitted to dip into its overall allocations as needed, rather than by stated quarters, because of seasonal aspects of track-laying.



Deep-drawing with

FEWER DRAWS

A 10-DRAW CIVILIAN JOB

CUT TO 3 DRAWS

AN 8-DRAW DEFENSE JOB

CUT TO 4 DRAWS

Towle does BOTH on MULTIPRESS®

Multipress does it again—this time on deep drawing operations. In addition to smooth, oil-hydraulic pressure control that gets the most out of every job potential, it offers quick, easy convertibility that meets changing production needs in a hurry!

The deep-drawn tubes shown above, which are later formed into five sterling silver napkin rings, are produced on this 35-ton Multipress at the Towle Manufacturing Company of Newburyport, Mass. Starting with a flat, 7¼" disc, the first draw produces a cup-like shape. The second draw deepens and narrows the cup, and the third produces a 1¾" tube 7" long.

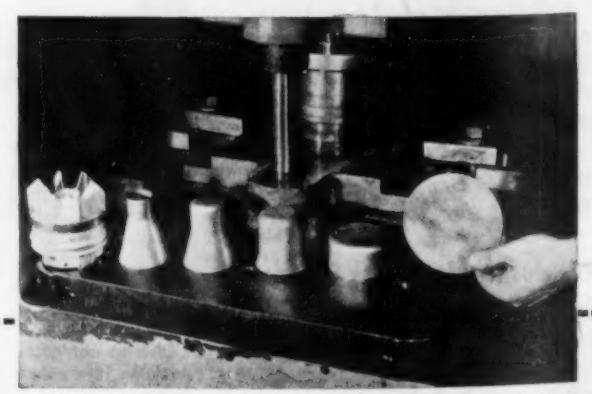
In only three draws, Multipress forms a tube that took ten draws by the old method!

Converted to defense work, the same Multipress forms special tubes used in rocket tail-fin assemblies. Instead of the eight draws formerly needed, Multipress does it in four! Dimensions of the tail-fin units must be held to very close tolerances, as they are used in high-precision assemblies. An aluminum disc 4⅞" in diameter is drawn to round tubing 1⅛" across the bottom, 3⅛" deep, and flared to 2⅜" across the top. Production rate is 7200 units per 8-hour day—with scrap losses held to a negligible factor.

Another Multipress at Towle paid for itself in three months by reducing several eight- and ten-draw jobs to only three or four draws—with better results and less scrap.

In still another case, when all five parts of a silver candlestick were preformed on Multipress, savings in a single year equalled the cost of the press.

The Multipress combination of *widely adjustable action* and *smooth pressure control* has proved to be the best answer to an amazing range of production jobs, including drawing, forming, flaring, stamping, crimping, staking, assembling, punching, slotting, blanking, broaching, trimming—and so on. Eight Multipress frame sizes offer capacities from one to 50 tons. Write for full details today!



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Strike Cuts Western Steel Output

Exact amount of loss still not known . . . Some producers unaffected . . . Most walkouts orderly, with maintenance crews remaining . . . Bitterness shows at Geneva—*By T. M. Rohan.*

Steel production in the West took a beating after last week's strike call, and at week's end lost production could only be estimated. Of the major producers only Kaiser kept in full operation, having independently signed with the union Apr. 2. Judson Steel in Emeryville, Cal., Pacific States in Niles, Cal., Seidelhuber Steel, Isaacson Rolling Mill Corp. and Oregon Steel Rolling Mills, all at Seattle, worked uninterrupted.

At all plants except Columbia-Geneva at Geneva, Utah, biggest employer in the state, walkouts were orderly. Output swing back to normal this week.

Fast Exit—At Geneva, employing 4900 total, irate steelworkers walked off within minutes after getting the strike notice despite pleas of union officials. Some walked off in the middle of a tap to join the milling picket lines which were hastily thrown around all entrances. Furnaces were banked and taps completed by 600 supervisory employees working around the clock to prevent damage.

Although pickets permitted food to go into the plant, no supervisors were allowed to reenter.

Reported cause of discontent was alleged violation of seniority laws by the company in laying off and recalling workers after the Apr. 8 strike threat.

Different Story—At the smaller (600 employees) Ironton plant of the same company, only 10 miles away, the 600 and 800-ton blast furnaces were banked and maintenance crews set up before the walkout. Approximately 1000 coal miners were involuntarily put out of work in company mines by the strike.

At week's end, most were back in production while Columbia-Geneva awaited outcome of eastern negotiations for guarantees of continued operations before resuming work. It opened the gates.

Warehouse Stock — Warehouses meanwhile had adequate supplies for at least a month's normal business. No rush of orders has been reported. Demand has been somewhat cut in metropolitan areas by a rash of strikes by construction workers. Buying is sporadic and not even threat of a price rise perked it up. Warehouse workers are mostly affiliated with the CIO International Longshoremens Warehouse Union and are not inclined toward sympathy strikes with CIO Steelworkers.

Who, Me? — The Los Angeles area steel industry which has borne the brunt of blame for the ill-famed smog chalked one up for their side last week. It was as thick and acrid as ever although practically all steel plants in the immediate area were idle.

"Not a plant accident . . . last night he joined the company bowling team."

Bundles Drop—West Coast scrap men were back in business and glad of it last week despite the hot and cold strike situation. Main reason for more activity was a $5-per-ton drop in price of No. 2 bundles all up and down the coast.

This differential in the face of growing price-consciousness gave buying a much-needed shot in the arm. One smaller firm was paying $5 under ceiling on all grades of scrap but volume was low.

Oil Deadlock—Independent and organized oilworkers' unions in California stood side by side for wage increases and other benefits last week. The state was exempt from the nationwide strike ostensibly because it would hurt supplies for Korea, but unions had no strong inclination to join the walkout.

Negotiations were being handled by the state conciliation service and are expected to continue so unless additional companies are affected. Federal intervention would probably be somewhat stronger than arbitration since talks have become largely deadlocked.

Back to Work—The World War II aluminum plant at Torrance, Cal., which has been idle for years will be put to use soon by Douglas Aircraft. U. S. Steel acquired the plant which is near its own Torrance operation in 1948 but changed its plans.

Douglas has held an option since January on the property consisting of 1 million sq ft of buildings and 200 acres of land. The new contract authorizes Douglas to use the buildings for Navy aircraft parts manufacture.

ZIP-ON SPEED NUT®

Tables 83%

ASSEMBLY SAVINGS

Merit Table Co., Inc., changes to standard Zip-On SPEED NUTS for attaching table legs—improves product quality—saves 4 assembly steps!

Coming up with an 83% assembly savings—in the face of today's rising costs—is quite an accomplishment! How did Merit Table Company, Inc., of New York, N. Y., do it? Simply by trading in a complex production cycle for the streamlined SPEED NUT principle of spring tension fastening! It once required two presses, a tapper and a spot welder to attach fasteners for table legs. Now—standard Flat-Type Zip-On SPEED NUTS are quickly applied by hand—releasing this equipment for other production.

Added to this 83% savings is the greater customer satisfaction Merit has built into their product. Since the legs are assembled to the table by the customer, it's important that the job be made simple and easy. All the fumbling and working "blind" that was necessary in positioning screws and nuts to attach the table legs has been eliminated by quick-on, stay-on SPEED NUTS!

Perhaps there's a SPEED NUT "Savings Story" waiting to be found on your production line—better fastening engineering can pay you big dividends! Call in your Tinnerman representative for technical assistance. And write for your copy of Tinnerman "SAVINGS STORIES", a FREE booklet showing savings made in a wide variety of fastening problems in industry: TINNERMAN PRODUCTS, INC., Dept. 12, Box 6688, Cleveland 1, Ohio. *In Canada:* Dominion Fasteners, Ltd., Hamilton, Ontario. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *In France:* Aerocessoires Simmonds, S.A.—7 rue Henri Barbusse, Levallois (Seine), France.

THE OLD METHOD...8 stamped metal plates were welded to table slide; 2 holes had to be drilled, tapped and countersunk; and 2 screws per plate were used for holding each leg to table.
SPEED NUT METHOD...8 SPEED NUTS and screws are used; each screw is put into clearance hole in table slide; SPEED NUT is "zipped" down to retain screw. Table leg goes over screw—wing nut is applied and tightened down. No instruction sheet needed.
TINNERMAN
Speed Nuts

Industry Fears Shorter Steel Supply

Canada imports one-third its steel from U. S. . . . Canadian steelmakers report onrush of orders . . . Purchasing agents worry over shipments . . . Controls change?—*By F. Sanderson.*

Canadian steel consumers hoped for a swift settlement of the steel dispute in America. News that steelworkers were returning to the plants and that the union would stay on the job heartened manufacturers. Their concern was rooted in the certainty that any kind of a drawn-out strike in the U. S. would diminish steel imports into Canada. And this country has been traditionally dependent for about one-third its steel from across the border. Imports of steel products from the U. S. involve over 1 million tons a year.

Industrial leaders here when faced with an endangered supply tried to gage steel reserves. They estimated Canada had enough steel in stockpile to continue production for from 4 to 6 weeks. Domestic production of steel is at an all-time high but importance of imports from America was suddenly highlighted.

Spirited Ordering — Meanwhile, Canadian steelmakers reported an onrush of orders last week. On heavy lines mills have been booked through September. It seemed certain that the second and third quarters would see a heavy carryover of unfilled orders.

Slack civilian interest in consumer durable goods has resulted in falling demand for wire and screw products. Merchant pig iron sales have skidded and nothing resembling a shortage is evident. Blast furnace operators say all business in pig iron is on a short term basis.

Purchasing Pessimism — Any price changes contemplated for steel and pig iron are hanging fire. Extent of any price rise hinges on labor and price settlements in the U. S. Negotiations between the steel industry and the Canadian steel union proceeded at a mild pace. Both parties were waiting.

Before the strike in America, purchasing agents here had turned somewhat pessimistic on future purchasing commitments. There had been a mood prevalent among the trade that supply was not destined for improvement. In Canada deliveries from mills are on a proration basis and imports from the U. S. have been restricted.

Onus on Industry — Steel consumers in Canada may be certain that price rises are in the offing. Government controls on steel are, of course, in effect—but the Directors have not acted too drastically to enforce them. The onus has been on the steel industry.

Now purchasing agents think it is time for some changes in controls. About two-thirds of them would like to see complete elimination of controls over distribution of materials and prices. One out of five purchasing men would like to get a simple system of priorities for direct defense needs. In other words, they believe that since defense takes only a certain percentage of materials, it is not necessary to control everything.

One out of seven would like to see retention of controls until labor problems are settled.

"By golly, Spring has slipped up on us again."

Machinery Fair — The International Trade Fair will open in Toronto on June 2. The Trade Fair makes a special feature of machine tools and equipment of all descriptions, with exhibits from makers in scores of countries of the world.

Space reservations by Canadian companies have more than doubled from 1951, and many British, European, U. S., German, French and firms from various other countries have made reservations for return visits to the Fair.

Nickel Expansion—Total annual production of nickel in the free world will be roughly 375 million lb, an increase of 150 million lb, when International Nickel Co. of Canada Ltd.'s current expansion plans are completed.

Inco reports it is mining ore at a record rate. Volume of ore from underground and surface mines totals more than 1 million tons a month. This is at an annual rate of from 12 million to 13 million tons. In World War II, 10.5 million yearly tons were mined on an average.

Going Underground — But with expansion Inco eventually expects to mine 13 million tons solely from underground mines. Inco intends to discontinue open-pit mining. Falconbridge Nickel Mines Ltd., Canada's second largest producer, is pushing a project to increase refined nickel output to 35 million lb annually.

No Industry Man on New Commission?

Hail new Production Equipment Advisory Commission . . . But industry regrets it may not be represented with member . . . Bedford doesn't mention stockpile in speech—*By G. Elwers.*

Last week's announcement of formation of a Production Equipment Advisory Commission was generally hailed by machine tool builders. They're glad to see a man of Harold Vance's calibre at the head of the group, and glad that Clay Bedford will be a member.

On the other hand, they're disappointed to learn that apparently no representative of the machine tool industry will be a member of the commission. Final composition of the 5-man group has not yet been settled.

Not Proper—It is reported that Washington officials do not feel it would be proper to have an industry man as a member. Washington feels the commission will have to pass on ideas which could be of important financial benefit to machine tool builders.

The so-called Bedford Plan was finally talked about in public by the author himself last week. As he told it, it didn't sound half as bad as advance reports had indicated it might be.

Stockpile Unmentioned—Washington has been full of rumors that Mr. Bedford favored purchase of several billion dollars' worth of machine tools to be stored away in warehouses against future defense needs.

But in speaking at the National Machine Tool Builders' Assn. meeting in Chicago last week, Mr. Bedford made no mention of such an idea. In fact he said he wanted to steer clear of the word "stockpile."

Enough for Defense—The term Mr. Bedford, retiring Special Assistant to the Secretary of Defense, used in his talk was "base-broadening of productive facilities." As outlined in his speech, this might involve no more than purchase of enough additional machine tools so that all current defense production could be accomplished in single-shift operations.

This would make it possible to triple defense production, if war comes, simply by adding second and third shifts. This wouldn't be easy, of course, since it would lead to materials and manpower shortages at first. But at least there would be no machine tool bottleneck involved in tripling output.

How E-1-b Works—Mr. Bedford also gave NMTBA members some idea of how the new E-1-b-type distribution system would work. It is allocation by the builders themselves, he said, but there will still be much allocation work which will have to be handled from Washington.

As examples of circumstances where this would be the case, Mr. Bedford cited tools for secret military projects, for experimental programs, and for programs where production goals have been substantially and rapidly expanded.

Recruiting Idle Tools—Mr. Bedford said he expected much benefit from the industry teams which will search for idle government-owned machine tools. NPA has been given authority to allocate such tools to defense contractors which need them. Some 40 machine tool experts are being signed up to survey defense plants for tools which are idle or not needed.

Mr. Bedford also announced that the effective date for the new machine tool output allocation system set up by the recent amendment to M-41 will be Sept 1.

How to Stay Strong—Six suggestions for keeping the machine tool industry strong in peacetime and ready for war were given at the NMTBA meeting by F. S. Blackall, Jr., president of the association:

(1) Federal tax laws should be modified to permit rapid depreciation on capital equipment in peace as well as in defense work.

(2) In renegotiation of earnings, the principle of carry-back and carry-forward, already an established feature of tax laws, should be recognized.

(3) Some sort of machine tool reserve should be established.

(4) A uniform procurement policy for all agencies of the government should be worked out with respect to machine tools.

(5) A complete standby pool order system should be set up in peacetime, ready to go in event of war or defense emergency.

(6) The government should stop aiding the competition of foreign machine tool builders.

The Iron Age

SALUTES

Charles Lee Austin

A financial expert has become an expert steelman by getting in the mills, asking questions.

LEE AUSTIN got into the steel business relatively late in life. He was 40 when he left Mellon Securities Corp. to join Jones & Laughlin Steel Corp. as treasurer and director. Now close to 50—he's been president of J. & L. since Jan. 1—you'd swear he'd been a steelman all his life.

Lee's athletic—has plenty of bounce and zest. He likes to get out in the mills and ask plenty of questions. And he's willing to get his feet muddy inspecting a construction job at Pittsburgh Works, Otis Works, or Aliquippa.

He talks to production men about quality, output, and equipment. A new production record has him walking on air. In short, he has acquired a genuine love for steel people and the steel industry.

Those who know him best say Lee Austin is warm-hearted and good-natured but a stickler for detail. He's an expert on financial matters. One of his objectives is to "sell" J. & L. to the investing public. He is an avid reader, can become interested in a good book on almost any subject.

Lee has two boys, one 20 and the other 17. He plays tennis and admits being a duffer at golf. At Princeton he played freshman water polo, was captain of the freshman crew. He was a varsity crewman for 3 years, and captain in his senior year.

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The Iron Age INTRODUCES

W. C. Snyder, Jr., president and chief executive officer, BLAW-KNOX CO., Pittsburgh, elected chairman of the board of directors.

Ward A. Wickwire, Jr., elected president, SALEM-BROSIUS, INC., Pittsburgh. He succeeds W. A. Wickwire, Sr., recently deceased.

George V. Slottman, elected a vice-president, AIR REDUCTION SALES CO., INC., New York.

M. F. Cotes, elected president and general manager, MOTOR WHEEL CORP., Lansing, Mich. **C. A. Benson,** elected treasurer; **Raymond Sanger,** elected assistant treasurer; **Thomas J. Fagan,** elected assistant secretary; **Karl Egeler,** elected vice-president-Duo-Therm Sales, and **Don F. Jones,** elected vice-president-Duo-Therm Engineering.

Gordon M. Byrnes, elected president, MILWAUKEE FORGE & MACHINE CO., Milwaukee. **Arthur A. Buettner,** elected vice-president and general manager in charge of production.

George J. Schad, elected a vice-president, TINNERMAN PRODUCTS, INC., Cleveland; **Robert C. Overstreet,** also elected a vice-president.

Samuel Zolin, appointed vice-president and treasurer, THE COOPER ALLOY FOUNDRY CO., Hillside, N. J.

Charles E. Bain, Jr., appointed manager of manufacturing, AMERICAN PULLEY CO., Philadelphia.

Leslie Touluse, appointed plant manager, CHRYSLER CORP., Amplex Plant, Detroit.

Bert O. Brand, elected vice-president and secretary, VANADIUM CORP. OF AMERICA, New York; **John J. Spollen,** elected controller.

D. G. Dodds, appointed vice-president-finance and secretary, WYCKOFF STEEL CO., Pittsburgh; **Norman W. Smith,** appointed treasurer and assistant secretary.

John F. Byrom, appointed sales engineer, Railway Div., Minneapolis, TIMKEN ROLLER BEARING CO.

John M. Dumser, appointed director of sales, Wolverine Tube Div., CALUMET & HECLA CONSOLIDATED COPPER CO., Detroit.

Alexander I. Stayman, elected vice-president-sales, PITTSBURGH SCREW & BOLT CORP., Pittsburgh.

Marvin S. Bandoli, named vice-president in charge of marketing and resarch, PLOMB TOOL CO., Los Angeles.

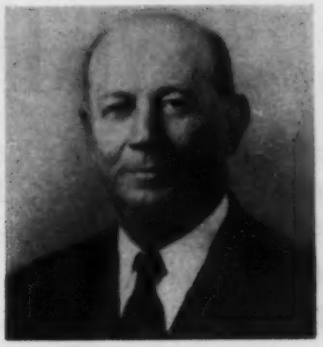
Clifford C. McAleenan, appointed vice-president in charge of sales, CAPEWELL MFG. CO., Hartford.

Walter S. Cibulskis, named chief of engineering; and **Frederick G. Bauer,** appointed manager of engineering, Engineering Dept., UNITED CHROMIUM, INC., New York.

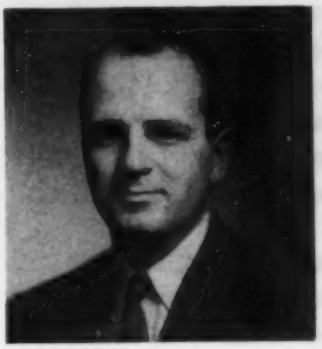
R. H. Krieble, appointed engineer in charge of the Thomson Laboratory, Lynn, Mass., River Works, GENERAL ELECTRIC CO., Schenectady.

Stuart L. Harrod, appointed manager, Machinery Div., AUSTIN-HASTINGS CO., INC., Cambridge, Mass.

S. K. Andersen, promoted to chief engineer, AIRESEARCH MFG. CO., Los Angeles.



CLAUDE S. LAWSON, elected president and chief executive officer, United States Pipe & Foundry Co., Burlington, N. J.



PAUL C. NICHOLSON, JR., elected president and general manager, Nicholson File Co., Providence.

L. G. GRAPER, elected vice-president in charge of research and technical advancement, Lone Star Steel Co., Dallas.

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Personnel

Continued

F. T. Whited, Jr., elected director, OLIN INDUSTRIES, INC., East Alton, Ill. **R. T. Moore,** also elected a director.

Richard Smith, named president, JET COMBUSTION, INC., Chicago. **Mrs. John Tegarden,** named executive vice-president; **Richard Kelly,** elected vice-president in charge of engineering; **Steve Kupres,** appointed vice-president in charge of field operations; and **Clyde Tegarden,** appointed secretary and treasurer.

Edwin H. Keiper, named chief engineer, PENNSYLVANIA CRUSHER CO., Philadelphia, a subsidiary of Bath Iron Works Corp., Bath, Me.

George F. Quayle, appointed assistant director of engineering, YALE & TOWNE MFG. CO., Philadelphia Div.

E. R. McClain, appointed director of traffic, THE TIMKEN-DETROIT AXLE CO., Detroit.

E. Stephen Farlow, appointed manager, Baltimore office, STERLING ELECTRIC MOTORS, INC., Los Angeles,

Stephen M. Martin, appointed mechanical engineer, STORTS WELDING CO., Meriden, Conn.

R. A. Anderson, appointed regional manager, Southwest Area, L. B. FOSTER CO., Pittsburgh. Mr. Anderson's offices will be in Houston.

Harry Bliven, appointed New England representative, STEINER-IVES CO., Newark, N. J.

Perry G. Snyder, becomes district engineer, YOUNGSTOWN SHEET & TUBE CO., Youngstown.

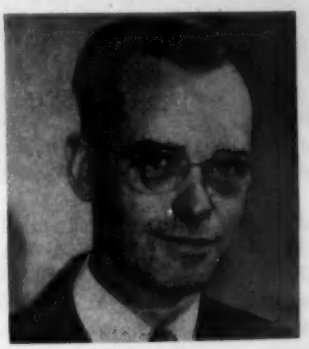
Worley Stapleton, formerly assistant superintendent, promoted to superintendent in charge of all production, Greenville, Tex. Div., TEMCO AIRCRAFT CORP., Dallas.

H. R. Arnold, appointed assistant to the manager, Aviation Gas Turbine Div., WESTINGHOUSE ELECTRIC CORP., South Philadelphia.

Rudyard R. Olson, named sales representative, Seattle district office, ALLIS-CHALMERS MFG. CO., Milwaukee, general machinery div. **Dean D. Moody,** named sales representative, Washington, D. C., district office.

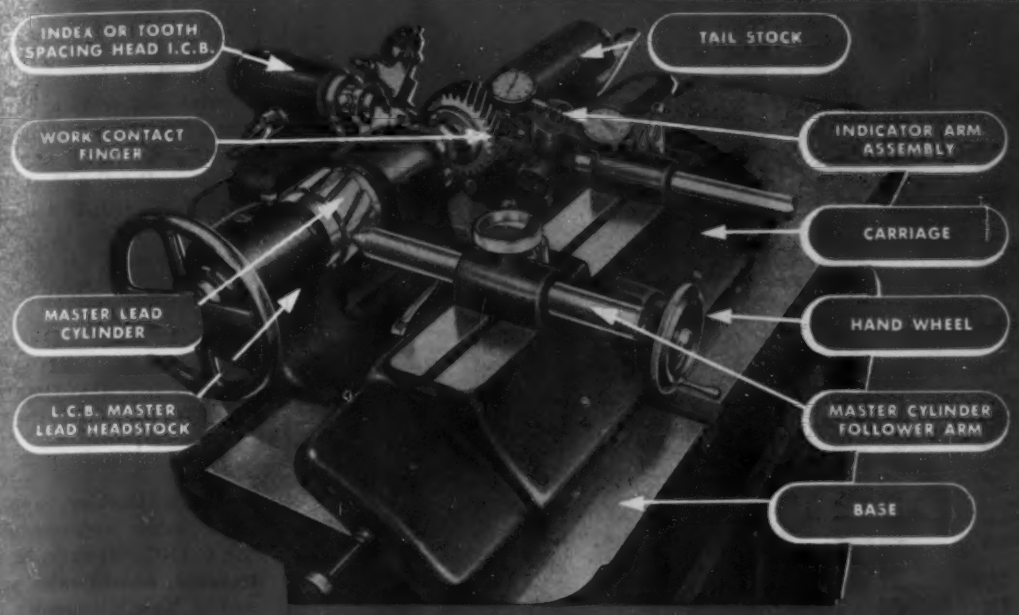
JAMES T. TOWNE, appointed assistant to the vice-president, Vanadium Corp. of America, New York.

O. S. CARLISS, appointed director of engineering, Philadelphia Div., Yale & Towne Mfg. Co.



OTIS R. CARPENTER, appointed executive assistant, Babcock & Wilcox Co., New York.

RICHARD COUCH, JR., appointed sales manager, A. Harold Frauenthal, Inc., Muskegon, Mich.



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Personnel

Continued

E. B. Shaw, promoted to supervisor of sales and service, **E. P. Kramer** joined the company as district engineer; **D. J. Palmer** appointed service engineer, DACAR CHEMICAL PRODUCTS CO., Pittsburgh, Coatings and Solvents Div. **H. J. Pollman,** also joined the company as district sales supervisor, Michigan district.

John P. Howland, appointed sales representative, Dallas Area, Wolverine Tube Div., CALUMET & HECLA CONSOLIDATED COPPER CO., Detroit.

William Buckley, appointed West Coast sales representative, TITEFLEX, INC., Newark, N. J. **Robert G. Brazenor,** named sales manager, and head of New Electronics Div.

John L. Michaelis, named contracting engineer, HEYL & PATTERSON, INC., Pittsburgh.

Herbert J. Heesch, named field sales supervisor, HOOKER ELECTROCHEMICAL CO., Niagara Falls, N. Y.

Herman Bergman, appointed director of statistical research, Kollsman Instrument Corp., Elmhurst, N. Y., a subsidiary of STANDARD COIL PRODUCTS CO., INC.

OBITUARIES

John S. Shaw, 67, former director of safety, Hercules Powder Co., Wilmington, Del.

Irvin S. Reiter, manufacturing specialist, Bethlehem Steel Co., Bethlehem, Pa.

V. M. Dobeus, president and general manager, Tractomotive Corp., Deerfield, Ill.

John A. Morrissey, 58, president and founder of Chicago Rivet & Machine Co., Bellwood, Ill.

George Lee Lindsay, director of tests and research, Universal Atlas Cement Co., New York.

Walter H. Bratten, manager, Canadian Sales Div., United States Steel Export Co., New York.

N. W. Westbrook, 58, purchasing agent, Southern Ferro Alloys Div., Tennessee Products & Chemical Corp., Chattanooga, Tenn.

The Iron Age
FOUNDED 1855
Technical Articles

Better design permits CHEAPER STAMPINGS

By Frederico Strasser
Consultant
Santiago, Chile

Don't design a stamping with only the end use in mind. Design it from the point of view of the production process, too. There are many design tricks that can cut stock waste, die cost, and scrap rate. Example: Redesign of a simple lever cut material costs 30 pct.

A part designed especially for manufacture on a press will be cheaper than one designed without regard to the production process to be used. Essential requirements of strength and shape must be met, of course. But beyond these, the thoughtless designer can lay out a part which will be difficult and expensive to form. Or, while retaining the essential part characteristics, he can keep in mind design details which will make the part easier to form. There are many important points to keep in mind regarding stock cost of materials. So it is necessary to avoid economy, pierced holes, and special operations.

The chief cost factor of stampings is usually the every bit of waste of stock. In the production of blanks cut from strips, the remaining skeleton is composed of bridges between adjacent blank openings and between blank openings and strip edge. It is often possible to eliminate one or both kinds of bridges, obtaining partially or totally scrapless blank design.

Components with sides at right angle are very easily blanked by scrapless or semi-scrapless dies. Parts can be produced by this method with sides not at right angles if the corresponding sides match in shape.

Another way for economizing material consists in utilizing the unavoidable waste, either blanking from the same strip different figures whose shape complement each other or employing the slug produced by the punching or piercing operation for further uses. The production of lamination dies for electrical motors is a typical instance. As shown in Fig. 1, while producing

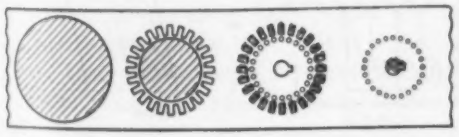

FIG. 1—When stamping out electric motor stator laminations, waste is reduced as shown by utilizing the center blank for motor rotor laminations.

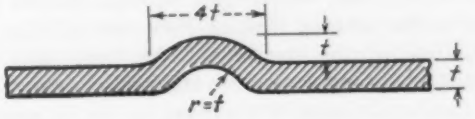

FIG. 2—Ribs often add strength to parts to permit use of thinner stock than otherwise. Recommended dimensions for ribs, based on stock thickness, are shown.

the stator rings the central slug is utilized directly for the rotors of the same motor.

When the precision requirements are not too high and shape allows, cropping dies should be employed. There is no lateral waste, because the strip has the same width as the part to be produced. The only scrap created is that which is cut by the cropping punch. Even this waste is avoided by shearing dies, but these can be employed only when both ends of the blanks have matching contours.

There is another way to save stock: Through material of lighter gage. Very often the same strength and rigidity can be obtained from thinner metal reinforced by ribs, flanges or curling. Ribs are best dimensioned in proportion to stock-thickness, according to Fig. 2 which gives minimum values. Ribs should not be made with the grain, but across it, like simple bends are made.

Complicated blanks waste stock

The shape and intricateness of a blank affects the time employed in the building of the die and therefore its cost. Also, stock utilization is usually unsatisfactory in case of complicated blanks. Tolerances must be left as ample as possible, because narrow tolerances require too much extra work which increases necessarily the production costs.

Each time when the design of the pieces allows, there should be a small radius at the corners. This will better the appearance of the part, will make die construction easier, and will increase the strength of the blanking die.

When producing round-edged workpieces cutoff from strips, edges should not be exactly half a circle, but an arc. In the second case, any slight, irregularities in the alignment between strip and cutting off punch are practically invisible.

Relieve bent flanges

Second operation forming and bending require special features from the blanks. If only a small projecting portion of a blank must be bent a slight notching in the proper places facilitates the bending operation. The shape of the notching is best trapezoidal. Of course, the best design is when the bending line lies outside of the edge of the larger portion of the blank.

Flanges which are bent only over a portion of the workpiece should be relieved by means of a round pierced hole at the point where tearing of the metal is likely to take place. It is also convenient that at the bending line the workpiece contour should meet at right angles.

Holes in bent workpieces should not be too near to the bending line, or they are liable to be distorted by the bending. The hole distance should be at least twice the stock thickness, plus the inside radius of the square bend. In case it is necessary to locate a hole nearer to the bending line, then a small hole is pierced in the bending line itself. This hole will then be distorted and the chief ones will remain practically unaltered. Another solution consists in piercing the needed holes after the blank has been bent, but this is much more expensive.

Piercing, or blanking, of round holes is always easier than any other shape or form. When a hole must be elongated, it is better made with rounded edges, instead of straight edges.

Pierced holes must not be located too near to the blank edges, to avoid distortions on the workpiece periphery. Between the hole edge and blank edge, distance should at least equal stock thickness. When piercing holes in drawn shells the distance from the edge of the hole to the inner wall of the shell should be at least twice the stock thickness, plus radius at bottom of shell.

If a threaded hole is needed in a stamping made from metal sheet, the hole should be extruded. Thus the length of the threaded hole will be doubled.

Lancing or lug forming operations consists of simultaneous shearing and forming of projections or ears. Unless special precautions are taken, the material tears at the points of maximum stress. The solution for this trouble consists in relieving the critical points by notches or by small round holes.

Part modifications lower tool costs

The bracket in Fig 3 originally required a progressive type, 2-station, piercing and blanking die. Following a conference between the product engineer and the die-engineer, the part was modified as shown. The new form conserved the location of the three small, round holes, which was the only detail which was important, and permitted making the part with a simple, 2-step progressive-type, piercing and cutoff die. Material saving was almost 30 pct. Also, the new die was built at an estimated saving of over 33 pct over the original die.

The can-opener of Fig. 4 was produced by a 2-station, progressive punching and blanking die. After the change in design it is made by a cheaper die and with much less material.

The part shown at top in Fig. 5 has been slightly changed permitting a much better utilization of the metal strip, as shown at bottom.

Especially in case of large workpieces, it is often advantageous to make pieces in composite

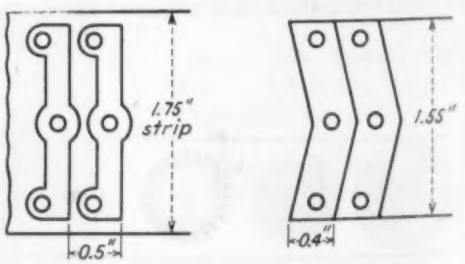

FIG. 3—Original lever design, left, wasted stock. Redesigned lever, right, retains size and location of holes but enables producing same lever with virtually no waste.

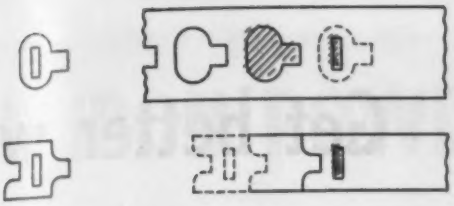

FIG. 4—Can opener head, top, wastes stock. Redesigned head, bottom, functions just as well but is produced with no stock waste except from rectangular hole.

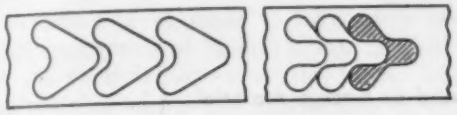

FIG. 5—Another case where part redesign is used to lower costs by reducing scrap loss in stamping operation. Former part shows at left, redesigned part at right.

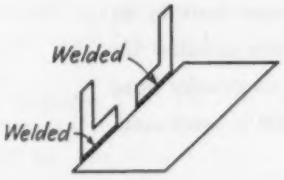

FIG. 6—This part was formerly stamped leaving lugs to be bent up as shown. Now three parts are cut separately and lugs welded on. Cost savings more than pay for welding.

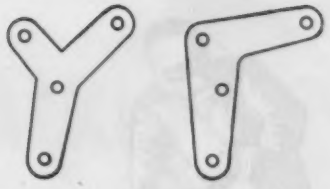

FIG. 7—Design at left is logical in view of location of holes in forging. But design at right retains same hole locations and is stamped with less stock waste.

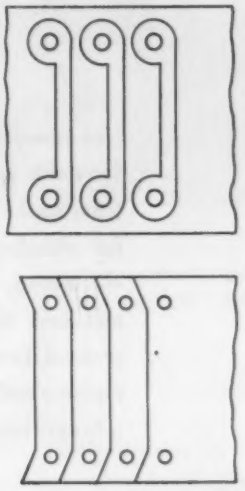

FIG. 8—This part was originally cast. But cast shape would waste stock if retained when converting to stamping as shown at top. Better design is shown at bottom.

construction, instead of as one piece. The part shown in Fig. 6 is welded together from the two pieces shown, instead of making one stamping which would be bent. Considerable savings in die costs and elimination of material waste compensated for the welding operation.

Drawing is not easy. Consequently, when it is necessary to produce deep shells with much more height than diameter, it is probably simpler to make the product in two pieces; a cylinder and a shallow bottom. These can be joined by some riveting, welding, or seaming.

The part of Fig. 7 was originally produced by forging. When its production as a stamping was decided, it was suggested to retain its original shape. But here there would be an exaggerated stock waste. Therefore the form has been changed, as shown.

In another case, a small lever made from cast iron, Fig. 8, redesigned for stamping production, permitted the design of a scrapless die with the consequent savings in material and tool costs.

NEW BOOKS

"The Memoirs of Herbert Hoover, 1920-1923," is the second in Herbert Hoover's recollections of his many memorable experiences in public life. This volume begins with his return from Europe and his entry into public life and administrative work in the United States. These were the years when Mr. Hoover entered fully into politics. He recalls his work during the Harding and Coolidge administrations, his work as Secretary of Commerce, and his term as President. The Macmilliam Co., 60 Fifth Ave., New York 11, N. Y. $5.00. 405 p.

"The Welding of Nonferrous Metals," by E. G. West. Mr. West has prepared a comprehensive volume on a subject which has gained tremendous importance during the past decade. Specifically covered are the welding of aluminum, magnesium, copper, nickel, lead, zinc, low-melting-point metals and high-melting-point metals. While much of the book tells "how" to weld the various materials, the work is basically devoted to the "why" of the metallurgical problems involved. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. $8.50. 553 p.

Get better welds W

Iron powder has been successfully used as backup material for welds on SAE 1015 and 1025 steels. Hardening resulting from rapid heat dissipation is counteracted, and the need for chiseling out and rewelding the root of the seam is eliminated. Powder is pressed into narrow sheetmetal channels and slightly sintered. Unsintered powder bars in as pressed form can be bent somewhat and are suitable for pipeline welding. Heat conductivity of the iron powder base is lower than copper plates. Grain sizes to 0.008 in. were used.

Metal base plates are sometimes used to help close welding seams. Loss of electrode material is prevented. Where the back of the weld is difficult to reach, repair work and application of closing beads are simplified. Recent German experiments, however, indicate iron powder backup materials may have several advantages over the copper or steel bars usually used.

V-seams, which will be subjected to high service stresses, must be freed of unavoidable defects occurring in welds made without appropriate backup material. This requires turning the weldment, and chiseling and rewelding the root of the seam.

In weldment of medium carbon steels, such as SAE 1030, the drawing of a single layer closing bead with a small diameter electrode causes high hardnesses of adjacent areas thus jeopardizing properties of the weldment.

Copper base plates do not eliminate defects at the root of the seam. Due to their rapid heat dissipation they cannot counteract the hardening of the base metal at the welding zone. Serious warpage is also caused by the use of such backups.

Steel bars are generally used as backup material only if they can remain welded to the seam. They have no ill effect upon the physical properties of the weldment itself.

Good backup material for welds should eliminate the necessity of chiseling out and rewelding the root of the seam, counteract the hardening effect of a rapid heat dissipation and should be easily removable. This has been achieved by developing base material for weldments which consists of iron powder of definite grain size.

To keep the powder in place, narrow channels of thin sheet metal are filled with tightly pressed iron powder, or the powder is compressed into flat bars of proper cross section which are slightly sintered. Several experiments were carried out with base material made from iron powder produced by the United Austrian Iron & Steel Works (VOEST) in Linz, Austria.

Chemical composition of the iron powder averaged 0.15 pct C, 0.35 pct Si, 0.25 pct Mn, 0.05 pct P and 0.10 pct S. Grain size varied from 0.004 to 0.008 and 0.024 in. in diam. The sheet metal channels, into which iron powder of the different grain sizes was pressed by hand, had a width of 13/16 in. and a depth of 3/16 in.

The compressed bars which had a cross section of 1 x 5/32 in. were formed in a press with 700 to 1400 psi pressure and used either in the pressed or in a pressed and slightly sintered condition. The "as pressed" bars can be bent to a certain degree and are therefore suitable for pipeline welding purposes also. The slightly

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Translated by H. J. Pessl, chief metallurgist, Lake Erie Engineering Corp., Buffalo, N. Y., from "Iron Powder As Base Material for Weldments," by Dr. H. Hauttmann, director of research and development, United Austrian Iron & Steel Works (Voest), Linz, Austria. Dr. Hauttmann's article originally appeared in Voest Yearbook for 1950-1951.

WITH IRON POWDER BACKUP

sintered bars have a better deformability and do not fracture as easily as the unsintered ones.

The weldments were made of SAE 1015 and SAE 1025 steel plates of ⅝ and 13/16 in. thickness of the analysis shown in the table. The V-shaped welding seams had side angles of 60° and 45° respectively. The opening at the root of the seam was held between 1/16 and ⅛ in.

Welds were made with Fox UMZ and Fox DMO electrodes of 5/32 in. and ⅛ in. diam. Weldments were subjected to tensile, transverse bending and notched bar impact tests. On some samples endurance and fatigue strengths were determined.

From the tests made with the various grain sizes of iron powder it was found that grain sizes up to 0.008 in. are most suitable for both the pressed and the compressed type of weld base materials described above. Mixtures of grains larger and smaller than 0.008 in., strongly compressed, were also used successfully. Compressed or slightly sintered back up bars result in better looking welding seams and, if the root layer is to be removed, require less rewelding than bases of hand pressed iron powder.

In Fig. 1 A and B show the root of a V-seam welded on iron powder, while C illustrates the same kind of seam welded without back up material, and D as welded against a copper base plate.

In Fig. 2 an etched cross section of 13/16 in. thick plate weldment is shown. The bulk of the backup material has already been taken off but to the root of the seam there still adheres a crust of sintered iron powder which can be removed by slight hammering or with a wire brush. A first root layer welded upon iron powder is very soft and can be easily removed by chiseling or grinding.

FIG. 2—Etched cross section of the V-seam of a 13/16-in. plate welded on iron powder base. Excess powder was removed from the back of the weld after welding. 1.25X.

V-seam welding experiments were made with copper and iron powders as base materials to evaluate the comparative warping effect. Under similar experimental conditions welds using copper powder as base resulted in a warpage of 5°. Those made with iron powder bases, however, equal to those made without any base material, showed a warpage of about 3°.

These figures further demonstrate the lower heat conductivity of the iron powder base compared with the copper base plate. This was also confirmed by other studies of steel hardening at the root of the welding seams.

When welding higher carbon steels, 13/32 in. thick SAE 1025 steel plates, using iron powder as base material, a lesser hardening effect occurs within the heat influence zone of the root layer than within that of the top layer. The relative Brinell hardnesses measured with the Rolldur hardness tester were 185 and 212. Within the heat affected zone of a rewelded root layer a

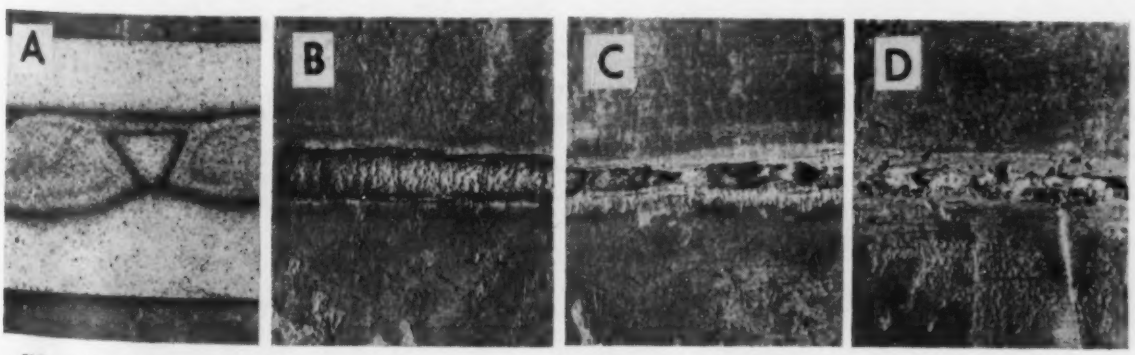


FIG. 1—Root of V-seam welded on pressed iron powder base appears at "A." At "B," root layer is shown after removing iron powder. Root of conventional weld is shown at "C." At "D," root of V-seam is welded with copper plate 1.2X.

Powder can be reused—

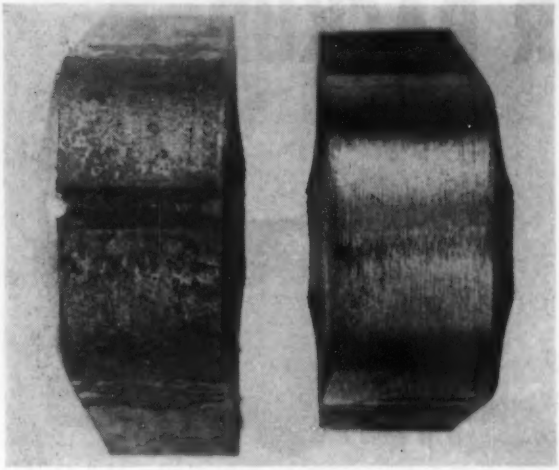


FIG. 3—Transverse bend test bars, with 150° bending angle, of 19/32 in. SAE 1025 steel plates welded on iron powder base. Sides of the roots of the welds were stressed in tension: Left, as welded; right, root layer surface machined.

maximum hardness of 300 Bhn. was found.

Notched bar impact tests of SAE 1015 and SAE 1025 steel plate weldments, with notches arranged so as to cut into the border zone between the root layer and the steel plate, gave impact values of from 300 to 500 ft-lb psi.

Transverse bend tests of 19/32 in. and 13/16 in. SAE 1015 and SAE 1025 steel plate weldments were made to stress the side of the root of the seam in tension. Bending angles of 150° were obtained with both steels without fracturing, regardless of whether the bottom layers were left as welded or worked off.

From 50 such transverse bend tests, with machined welding seam surfaces, 30 showed no indication of fractures, Figs. 3 and 4. In 20, short fractures occurred only. All bars tested with the original welding layers remained intact with a single exception, the fracture of which was on examination found caused by a defective weld. Standard tensile tests across the weldments resulted mostly in fracturing outside the weld in the SAE 1015 steel at tensile strengths from 63,000 to 71,000 psi. Test bars of the SAE 1025 welds fractured more frequently through the welds at 71,000 to 77,000 psi tensile strengths.

STEEL ANALYSES

Steel	C	Si	Mn	P	S
SAE 1015	0.12	—	0.30	0.031	0.026
SAE 1025	0.19	0.28	0.40	0.021	0.043

Rotating beam bending and endurance tension tests were carried out with 9/16 in. thick welded SAE 1025 steel plates. The plate had a yield strength of about 42,000 psi, a tensile strength of 69,000 psi, 25 pct elongation and 53 pct reduction of area. Specimens with machined welding seams reached a rotating beam bending strength from 28,500 to 35,000 psi. These values are in substantial agreement with results obtained by this test from conventionally welded SAE 1025 steel plates of the same thickness.

Use of iron powder for this purpose is of equal advantage in the automatic machine welding method. The easily removable infused rests of the pressed iron powder base can be used again. Parts from compressed iron powder bases can be ground and used as bottom material in pressing of channels. Slightly sintered bases, which can be used only where great deformation occurs, such as in the welding of small diameter tubing, cannot be reused.

In many cases savings may result from use of iron powder despite its higher cost. Iron powder suitable as base material for weldments, if necessary of lower carbon and sulfur content than the one used for the above experiments, can be obtained in ready pressed or slightly sintered bars or as strips.

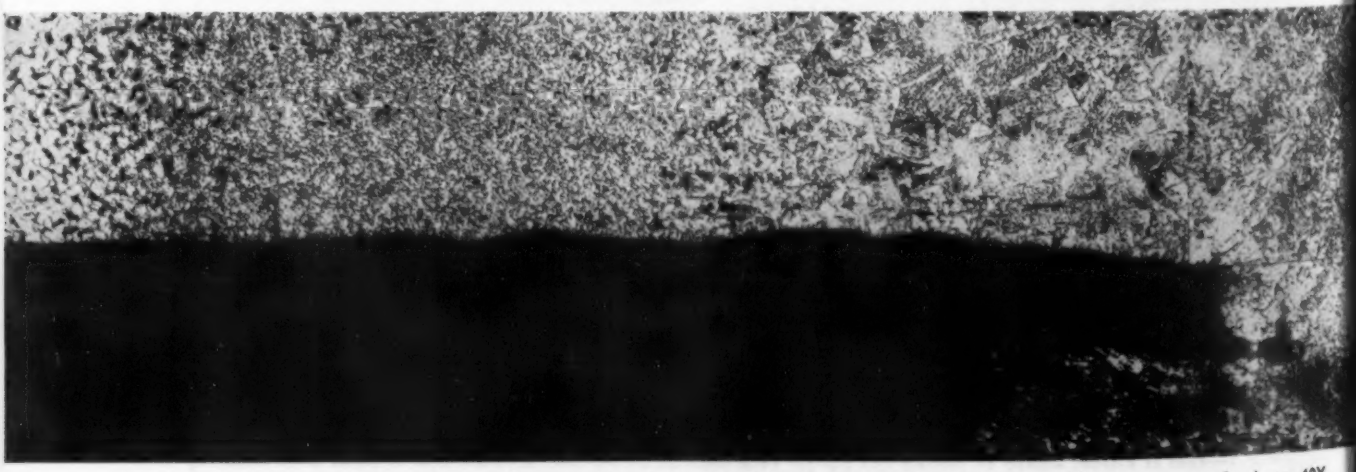


FIG. 4—Grain structure at the root of a V-seam weldment of a 13/16 in. thick SAE 1025 steel plate welded on iron powder base. 40X.

Less red tape via MIL-Q-5923A—

QUALITY CONTROL MANDATORY

On new Air Force orders

By Dorian Shainin

It pays to know the Air Force's revised quality control specification MIL-Q-5923A. It tells the "what" of quality control in your plant and leaves the "how" up to the contractor and local Air Force representative. This revised version of the old MIL-Q-5923 can save you time and money and cut through red tape in your plant. A legal angle has been clarified to your advantage. Shopmen and engineers get a break on new design work. It can simplify the work of your own inspection department. Now being used by the Air Force, other services may use the specifications.

"BUT your contract calls for compliance with MIL-Q-5923A." An Air Force man may be saying this to you. It pays to know this specification for *"Quality Control of Aircraft and Associated Equipment"* and what it implies. It supplements the article in all contracts requiring an inspection system acceptable to the Government. Minimum Air Force requirements for an acceptable quality control system are spelled out. Tied in with this specification is Directorate Office Instruction No. 74-1, setting forth the duties of Air Force quality control inspectors, further clarifying the inspector's job.

The Air Force knows that even the best control

Everyone is a lot happier . . .

The contractor and his lawyer . . .

system will produce some defective items.* Because there must necessarily be fewer Government inspectors than those of the contractor in a plant, you are expected to maintain an adequate quality control system. MIL-Q-5923A is a definition of what is adequate under these conditions.

* D. Shainin, "*Sample at Random for Correct Statistical Control*," The Iron Age, Oct. 12, 1950.

Provisions are made to review material that departs from requirements of the contract, drawing or specifications, provided the contractor takes prompt, effective action to prevent the recurrence of the discrepancy. The Air Force inspector may accept on a limited recurrence basis material containing minor discrepancies which do not affect the safety or performance of the end article. The materials review procedure includes thorough consideration by qualified engineering personnel. Material so accepted can thereafter be handled as normal, good material commanding full price.

Use of statistical quality control charts that keep causes of extra variation away from a process is encouraged. Such process control procedures may be used to reduce final inspection requirements at the option of the Government. By allowing some of the newer techniques that keep a process out of trouble, you are doubly benefited through a reduction in the amount of final checking you and Government inspectors have to do.

The Air Force relies on objective quality evidence. It looks first for valid indications of quality and acceptability of supplies in the form of reports, certificates, control charts, or definite knowledge that sufficient checks are being made. You obtain the evidence and make it available for evaluation and verification. Secondly the Air Force does some product inspection for this verification as well as sometimes getting direct evidence themselves.

MIL-Q-5923A describes the "what" and leaves the "how" up to the contractor and local Air Force representative. It asks that you submit evidence of conformance to contract requirements from receipt of materials to shipment of products. This Air Force specification was first issued as MIL-Q-5923, Dec. 8, 1950, and was reissued in its present A version Sept. 14, 1951. It is important to know the changes made.

Many existing contracts carry the requirement for meeting the earliest version of the specification. You may petition for a contractual change to permit the use of the A version, with the expectation that your request will be granted by the Government. These differences bring out the importance of working to the later version.

Formerly prime contractors were responsible for making specifications binding on all subcontractors and suppliers. Under the A version the extent to which such provisions shall be made binding on subcontractors and suppliers shall be as agreed upon between the prime contractor and local Government inspector.

Another practical change eliminates from the contractor's quality control manual detailed inspection and testing operations formerly included for Air Force inspectors. This is intended to cut down and simplify your manual.

Of interest to your legal people is the statement on Air Force quality control ratings. A "disapproved" rating first constituted a default of contract. Now the rating only indicates failure to provide an acceptable quality control system as required in the contract.

Your shop people will find practical the reword-

The production manager and his chief inspector . . .

The Air Force . . .

ing of the section under drawing and change control. The contractor formerly had to remove obsolete information at the time revised drawings or changes were made. Technically, this gave no change to plan for changes before the time they became effective. It would have helped to be able to work to the new drawings for preparing tooling, gaging, etc. The new wording calls for removal of information at the time the revised drawings or changes become effective.

Contractors, who want to wait a little longer before plunging into new techniques, are happier with the new version. A clarifying statement says sampling inspection shall not be construed as requiring the contractor to establish a statistical quality control system. Also, while any sampling by attributes, when elected by the contractor, should be in accordance with MIL-STD-105A, other plans can be approved by the Government.

A detailed materials review procedure had to be followed for material at subcontractors' plants. This now specifically applies to subcontracted supplies that get Government source inspection along with the option that the prime contractor may determine that such procedures are either not required or shall be accomplished by the prime contractor. On proprietary items, the designer normally retains material review authority for variations not related to specific requirements of the prime contractor.

A final major difference pertains to inspection records. Formerly all quality characteristics had to be listed. Now only physical and dimensional properties that would affect safety or cut usability had to be listed. While both versions require that results of interchangeability inspections and functional tests be indicated, the former document required the methods of testing be included.

Evidence of proper inspection must be provided. These records must show all required inspections and tests made, and the number and reason for rejections in each sample or lot. A reflection of their recurrences, and details of corrective action taken shall also be shown.

The contractor's quality control manual must be completed and approved by the Government inspector not later than completion of the first production article.

Equipment and personnel for special processes shall be subject to approval as required by Government specifications. If you have subcontractor doing welding, X-ray, magnetic inspection, heat-treating, plating or anodizing, any of these items can be covered by requesting Government source inspection. However, the article may be generally capable of being inspected for other characteristics upon receipt at your plant. Then you may request Government approval and/or certification of the subcontractor's processes if the subcontractor has already had Government certification.

In many plants, unimportant departures from the specifications even though they are reworkable conditions, are normally accepted on a special basis to avoid adding unnecessary costs. The revised spec states that when material can be made acceptable by rework it shall be done.

The Government has the right to inspect at source articles that cannot be adequately or economically inspected upon receipt. It is the prime contractor's job to determine the items in this category and to submit purchase orders requesting Government source inspection for approval of the Government inspector. Government source inspection is never considered a guarantee of final acceptance, nor does it relieve the prime contractor of the responsibility to furnish an acceptable end article. You also have the job of furnishing the Government inspector a report of all discrepancies found on Government source inspected supplies received at your plant.

Perhaps the taxpayer may even get a break, too!

Treated on the run—

Rotary furnaces feed

By A. O. Smith
American Gas Assn.
New York

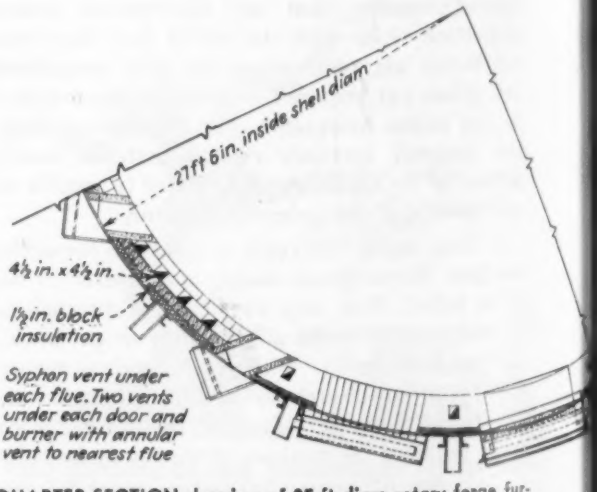
Billets for 90, 105 and 120 mm shells are being hot extruded, draw-formed, rough machined and tempered in a completely new, automatic setup. The gas-fired, rotary heating-for-forging furnaces can handle up to 24,000 lb of steel per hour, on a 15 min cycle at about 2300° F. Conveyers and other equipment make materials handling almost completely automatic. The heat-treating and draw furnaces are also rotary, processing about 300 28-lb shells an hr at 1525° F and 950° F respectively.

Two new jet combustion, gas-fired forging furnaces and a modern conveyer system have been installed in the East Chicago, Ind., plant of General American Transportation Corp. They are to be used for the heating and handling of billets for 90, 105 and 120 mm projectiles. These billets are hot-extruded and draw-formed.

The two forge furnaces and billet handling manipulators for charging and discharging the billets were designed and built by Jet Combustion, Inc., Chicago. The company has done considerable gas combustion and material handling engineering in other General American Transportation plants.

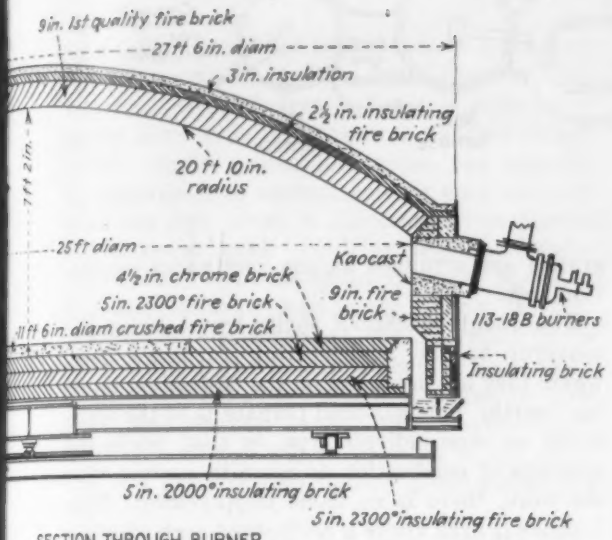
The forge furnaces are direct gas-fired with a 25-ft diam rotary hearth, operating 24 hr a day. Each has a capacity of 24,000 lb of high-carbon or low-alloy steel per hr, when operating on a 45 min heating cycle. This volume of output not only meets the production schedule for shells in the plant where the equipment is installed but also permits forgings to be made for outside customers.

Twelve North American 113-18B dual fuel burners are located equidistantly around the furnace. They are inclined slightly toward the arched roof and set at approximately a 45° angle


27ft 6in. inside shell diam
4½ in. x 4½ in.
1½ in. block insulation
Syphon vent under each flue. Two vents under each door and burner with annular vent to nearest flue

QUARTER-SECTION drawing of 25-ft diam rotary forge furnace, capable of heating 24,000 lb of shell steel per hr.

AUTOMATIC STEEL TREATING LINE



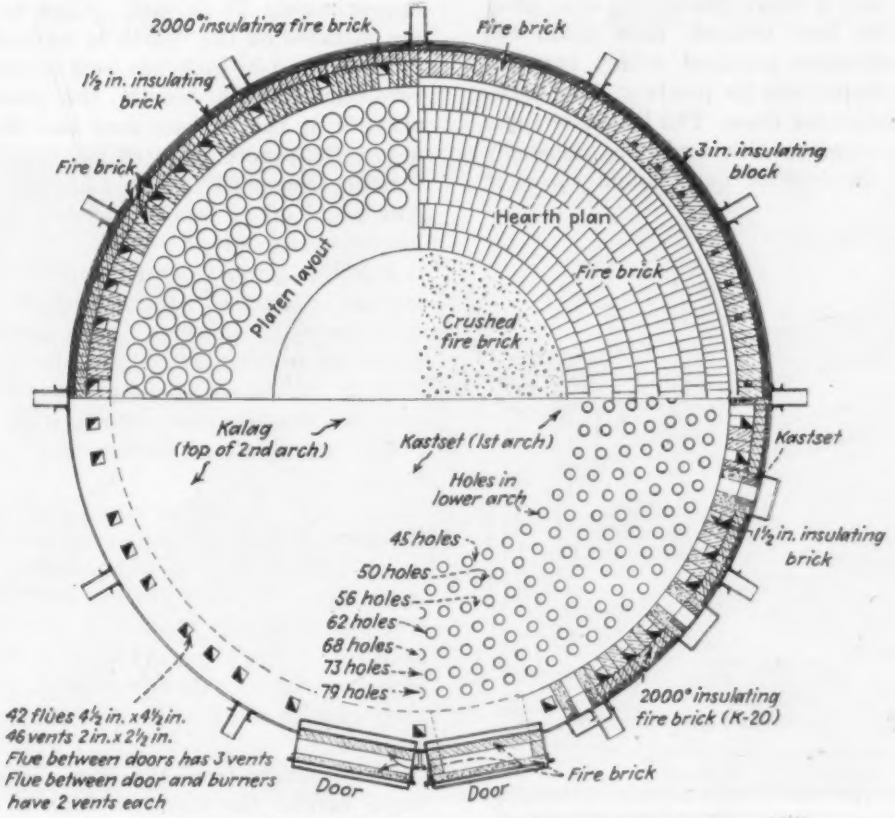
SECTION THROUGH BURNER

REFRACTORY LINING details of rotary forge furnace.

against the direction of hearth rotation. Each burner has an input rating of 3.8 million Btu, or 45.6 million Btu for the entire furnace. Both furnaces are normally operated at 2300°F. The angle setting of the burners sets up a swirling motion of the flames and hot gases. With the radiation from the arch, this makes for even heat distribution over the entire hearth area. In addition, the hot products of combustion are carried down and over the work to the flues set below the hearth area level.

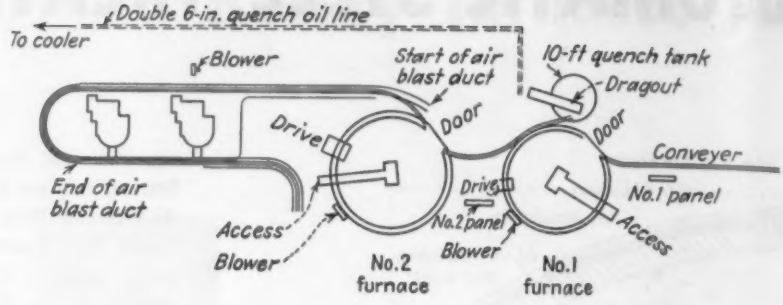
Combustion air is supplid to the burners by a 25 hp, 6 oz blower for each furnace. Leeds & Northrup automatic proportioning controls maintain accurate temperature settings.

The furnace arch is constructed of 9 in. first quality fire brick, 2½ in. of 2300°F insulating fire brick and 3 in. of insulation. There is no center wall, which reduces radiation loss to a minimum. Any water vapor that may develop from



ROTARY HARDENING furnace, 20-ft diam, showing hearth plan, perforated lower arch, top arch and platen layout.

From forge and press—



CONVEYER, COOLING, hardening and draw furnace layout.

the seal is carried out through the flues, so that it does not contaminate the combustion gases. The burner flames are slightly oxidizing to form a loose scale. This is removed before billets enter the presses. The loss from scale is approximately 1 pct.

The circular rotating hearth has a 6-ft wide outer surface to support the work. It is made of 4½ in. chrome brick, over 5 in. of 2300°F fire brick, more than 5 in. of 2300° F insulating fire brick and over 5 in. of 2000°F insulating fire brick. The center top layer of the hearth on which no work rests is made of 4½ in. of crushed fire brick.

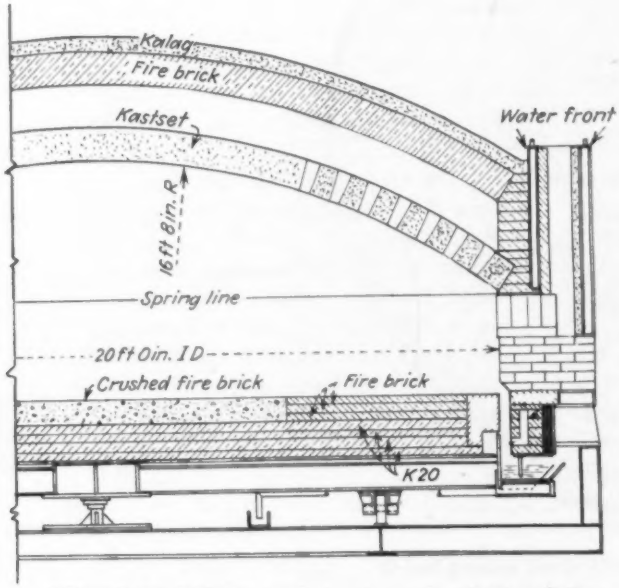
From the forge and press lines the shells go on to a cooling conveyer, from which some of the shells are sold as forgings. Others go through shotblasting and a rough machining line, after which they are heat treated. Here again two new Jet Combustion gas-fired rotary furnaces have been installed, one for precision heat treating and the other for draw. The layout of these two furnaces together with a new and unusually compact Jet Combustion quench and conveyer system are arranged as one continuous production unit.

The rough machined shells travel along the conveyer to the heat-treating furnace's door, where they are deposited on the 20-ft diam rotating hearth. This gas-fired furnace is of the semi-muffle or semi-indirect type, in that, while the products of combustion do come in contact with the work, there is no flame impingement. This furnace is fired above a perforated arch which is set 12 in. below the top arch. The products of combustion flow down through the 5-in. diam perforations in the lower arch. This perforated arch is 9 in. thick and the 433 holes are arranged in 7 circles over the work on the rotating hearth. Operating on a 1 hr cycle at 1525°F, the furnace has a capacity of 300 shells per hr, weighing approximately 28 lb each. Alloy iron supports are installed on the hearth to support the work.

When the 1-hr cycle has been completed by one revolution of the hearth, the shells are discharged at the furnace door and picked up by automatic, counterbalanced manipulators. These transfer the shells to a rotary oil quench, in which the oil is totally enclosed. To maintain proper quenching oil temperature, an evaporative cooling tower is located outside of the building and is equipped with proportioning temperature control. Inside the quench machine, the oil is applied to both the outside and inside of the shells for uniform quenching. After this they are elevated, drained, and automatically placed on the conveyer, which carries them to the draw furnace.

This draw furnace is also gas-fired and is of the same type as the heat-treating furnace, having a perforated arch which makes it a semi-muffle type. The only differences is that the rotary hearth in this furnace is 24-ft diam and is operated at 950°F on a 1½ hr cycle. A larger capacity enables this furnace's longer cycle to keep up with the 1 hr cycle of the heat-treating furnace.

On discharge from the draw furnace, a conveyer carries the shells through a cooling air blast. They emerge cool enough to be handled and proceed to shot blasting and finishing operations.



DETAILS OF ROTARY hardening furnace's refractory lining.

Small press does job of presses TEN TIMES BIGGER

An inflatable rubber bag is used in a new type of press for shallow metal forming. The Wheelon Direct Hydraulic Press is intended to do the same type of work now handled largely by the Guerin process of rubber pad forming. In comparison to equipment now used for such work the new press is far smaller, less costly, and produces work requiring less hand forming. It also is capable of much higher pressures than are commonly used in the Guerin process.

As in the Guerin process, metal forming on the new press involves a single male die. Sheet metal blanks are placed over simple inexpensive form blocks and pressure is applied by hydraulically inflating a rubber bag in the roof of the press. The new press has no moving parts except the bed.

The bag is inflated by a high pressure and a low pressure pump. Upon reaching a preset pressure, the pumps are automatically unloaded and the bag decompresses through a surge valve for a short timed interval. After this the low pressure pump withdraws the remaining oil and lifts the bag.

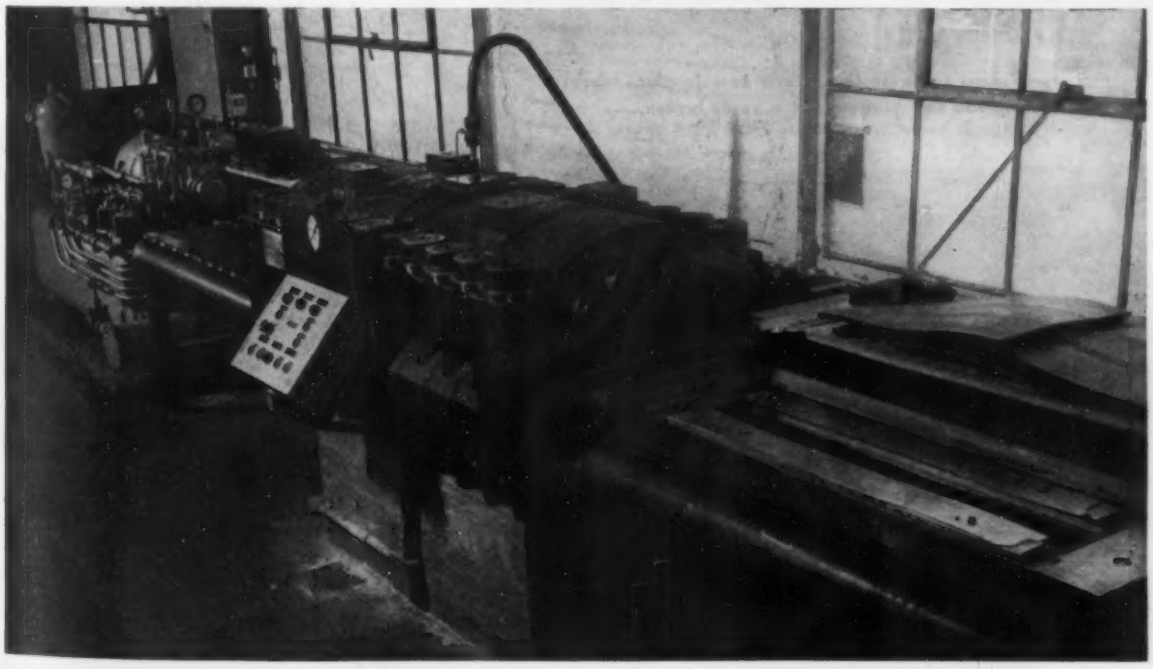
Present specifications call for a depth of draw of 3 in., with 4 in. available over 50 pct of the platen if desired. Total cycle time for an average part is on the order of 45 sec.

Usual Guerin process pressures range between 1000 and 2500 psi. The Wheelon press permits pressures of 5000 to 10,000 psi. This permits more perfect forming of heavier gage metals. Forming at higher pressures also reduces the need for subsequent hand forming. Use of a pilot model of the press has reduced handforming about 50 pct using existing dies. Die modifications are expected to reduce handwork even more.

The initial cost of the Wheelon press is a fraction of the cost of conventional hydraulic presses. This makes it practical to make many installations in various parts of a plant layout, to speed production. Production of the press itself is relatively simple. Its construction uses little steel and no critical materials.

Because of low cost and small size, the press is expected to widen subcontracting to small shops of aircraft and other parts which cannot presently be subcontracted except to major manufacturing establishments.

The Wheelon press was developed by Douglas Aircraft Co. and will be manufactured and sold by Verson Allsteel Press Co., Chicago.



PILOT MODEL of the Wheelon press installed at Douglas Aircraft. This 5000-psi model can apply a total load of 2500 tons. It has formed aluminum sheet in gages up to 1/4 in. Contrast the low headroom, small floor area, and simple foundation this press occupies with the space and foundation requirements of a conventional 2500-ton press.

Shape flash to speed production—

CORES SIMPLIFY MACHINING of flash welded parts

By J. Conlogue
Asst. General Foreman
Tractor Plant
International Harvester Co.
Chicago

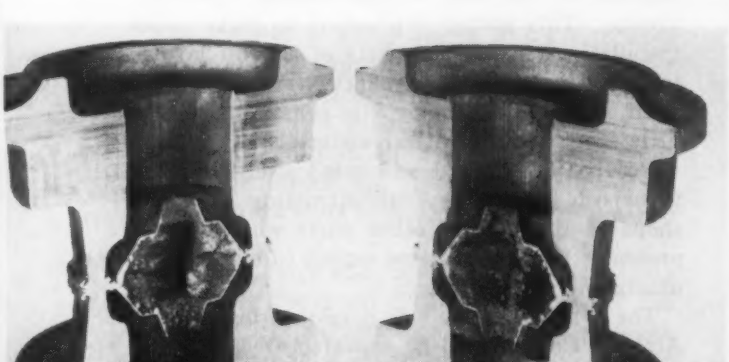


FIG. 1—Welded roller, sectioned with core in place, shows how cores spread out splatter so it is easily broken.

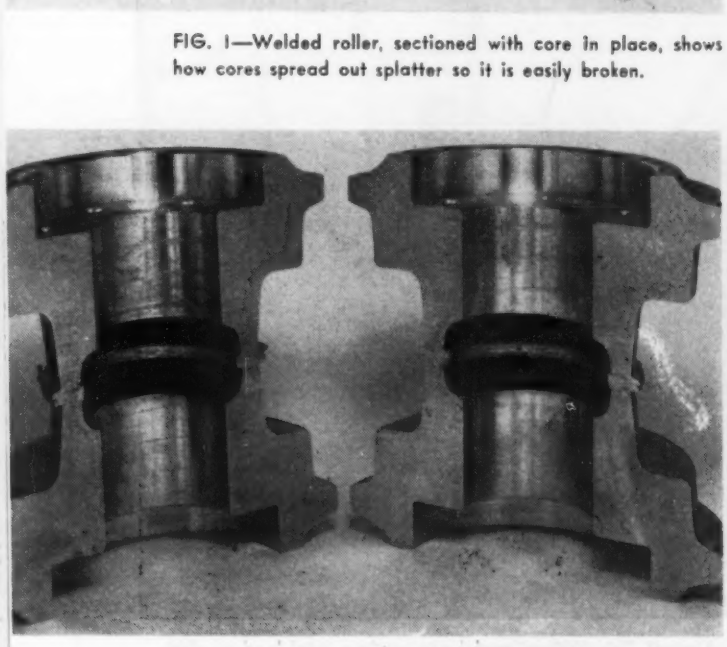


FIG. 2—Roller assembly is shown, sectioned through center, after core has been removed and machining completed.

Machining tough weld spatter from the inside of a flash welded track roller assembly proved a headache for International Harvester. A novel use of cores solved the problem. Two specially shaped cores were inserted before flash welding. These shaped the contour of the weld spatter, collecting some and making the balance easily broken and pushed out by a small hydraulic press.

A recent engineering change in design of track rollers for International Harvester's crawler type tractors resulted in a novel method of removing weld spatter from inside the welded roller.

An impression or pocket was designed in each forged half of the roller. In use, these pockets provided an oil reservoir for lubricating purposes. Because of the change, however, it was necessary to find a method of eliminating flash spatter on the cavity walls so the lubricating system would not be contaminated with highly abrasive particles.

First attempts to produce this cavity consisted of flash welding a heavy-walled roller. A machining operation removed the necessary material for the cavity as well as flash spatter adhering to cavity walls. This machining operation, due to inaccessbility of the area and presence of the highly abrasive flash spatter, was exceedingly difficult.

A method was sought which would produce a

reservoir wall free of adhering weld spatter. This would make it possible to include the cavity in the forged roller halves, reducing the machining required. Coating the cavity walls with a commercial type weld spatter compound before flash welding made machining more difficult. A stream of air shot through the hollow roller hub during the flashing cycle was tried. This stream of air coming from each end of the roller and meeting in the center had the effect of chilling the flash particles and reducing the amount of adhering weld spatter. This, however, only partially eliminated the weld spatter.

A sand core, similar to those used in foundries, was developed which could be inserted into each of the roller halves as they were being loaded in the flash welding machine. The heat resistant core was designed to collect the weld spatter, and yet be easily removed. This core, (two used per weld) protected the walls of the reservior completely, allowing the flash spatter to form in the shape of a cone on top of the sand and in a position, Fig. 1, where it could be easily punched out by a small hydraulic press.

To be easily removed, the core had to be designed so that the flash-cone would break into three major pieces, leaving the walls of the oil reservoir cavity free of spatter, Fig. 2. This was accomplished by providing three bosses on the interior surface of the sand cores, Fig. 3. The upset material remaining in the oil reservoir was solid metal, free of flash, eliminating the possibility of oil contamination.

Fig. 4 shows the weld spatter adhering to walls of the oil reservoir cavity when the sand core is not used. The macrosection, Fig. 5, shows the condition existing when the core is not used and typical flash-cone formed when the core is used.

The method considerably reduced and simplified machining operations. Use of sand cores would not be economical, however, where a straight line hole or bore could be incorporated in the design making possible the use of a simple punching operation to remove the weld spatter.

FIG. 3—Inside and outside contours of sand core are shown. Two cores are used for each assembly. Ribs weaken spatter.

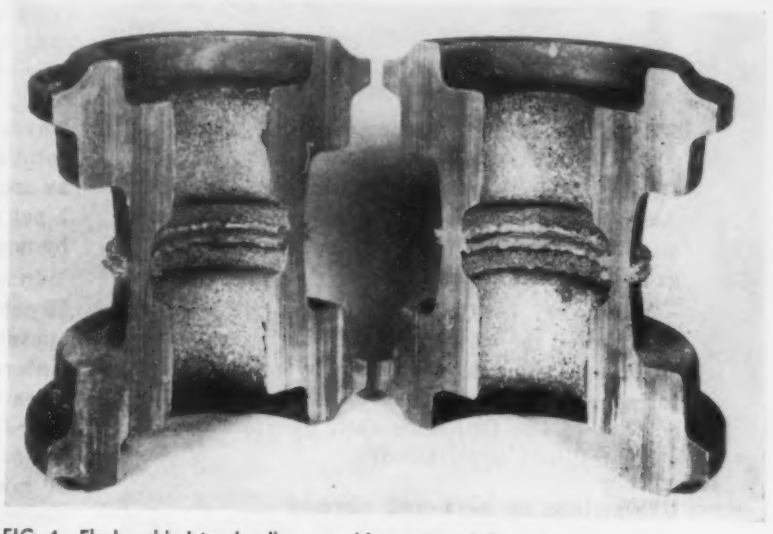


FIG. 4—Flash welded track roller assembly, sectioned through center, as welded without use of sand core.

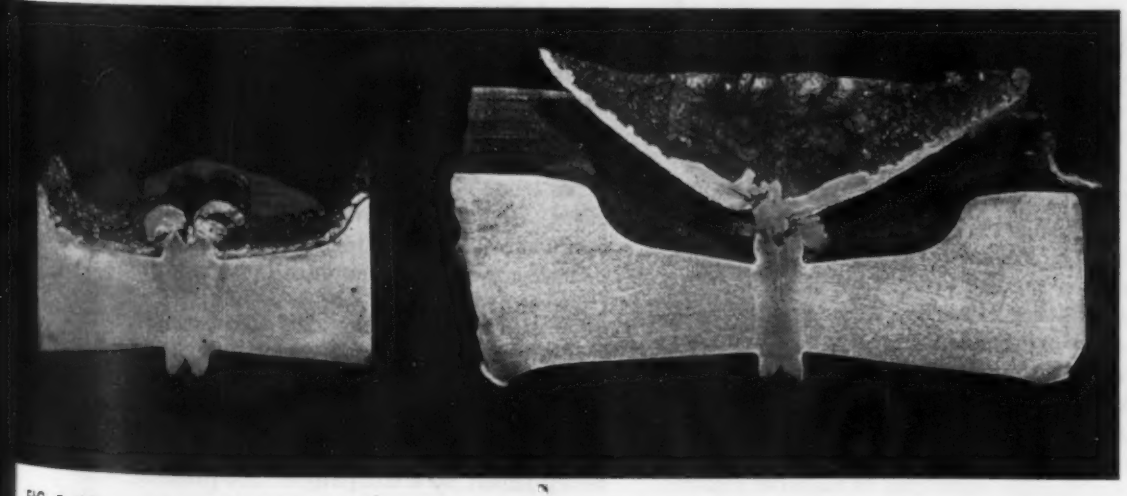


FIG. 5—Macrosection of flash welds made without cores, left, and with sand cores, right. Core use cuts machining.

Stepping forward—

METAL POWDER INDUSTRY SE

The Chicago meeting of the Metal Powder Assn. last week marked the coming of age of this metalworking industry. Tenor of the meeting was hopeful, bright. Use of metal powders, both at home and abroad, is swinging steadily upward, especially in the electrical and machine tool fields. But Ordnance, experimenting widely with application of sintered materials, may be the biggest user, with iron powder rotating bands and small arms ammunition. A new hot-pressing technique described turns out parts with close to full density. Far less machining is needed with hot-pressed parts.

The swift growth of metal powder in industrial use was outlined last week at Chicago's Drake Hotel, as members of the Metal Powder Assn. convened to elect new association officers and hear technical papers by leaders in this fast growing metalworking field.

What they heard sounded good. Metal powders are on the way up. Watched with considerably more than deep interest by military men for some time, metal powders will wax more important in the Ordnance shell program and in other military applications.

Use swings up here and abroad

Abroad too, metal powders are upswinging in importance, particularly in the electrical and machine tool fields.

Metal Powder Assn. chose its new officers: Ernest Klein, president; Thomas Moore, vice president; Thomas Robinson, chairman of the board; George Roberts, director of the board.

Sintered iron rotating bands and small arms practice ammunition could save ordnance $8 million per year, Capt. John D. Dale, Ordnance Corps, Frankfort Arsenal, told members of the Association.

Difficulty in the use of sintered iron for military shell rotating bands has been largely in the impregnating material used, as it affected corrosion inhibition, shell banding methods, ballistics, and rate of erosion of the run barrel. During firing of the shell, the sintered iron rotating band is subjected to terrific stress. In microseconds the band is subjected to massive plastic deformation, then high hoop stresses as it leaves the gun barrel. At the latter point, the rotating band may have increased in density by as much as 50 pct, ductility may be reduced to 1 pct elongation, and the metal has been upset by nearly 80 pct in two successive stages.

Inasmuch as the band can loose as much as 75 pct of its tensile strength during the banding operation, the band blank must be so thoroughly sintered as to cause the original particle boundaries to disappear. The Germans during World War II produced acceptable structure by sintering at 1300° C (spread to 50° C either way) for 30 minutes in molybdenum-wound electric furnaces. Ordnance here prefers to leave selection of processing methods to the fabricator, however.

Second important Ordnance project, Captain Dale indicated, is use of sintered materials in mechanical time fuze components and VT fuze components. Large scale use in the M21A4 booster rotor has already been achieved here. And last November the first sintered 50 caliber cartridge case was drawn from a billet of sintered iron. This is still developmental, but indicates annealing between the three drawing operations required is unnecessary. A 20 mm practice shell has been developed using largely sintered iron.

Hot-pressing technique described

Jerome F. Kuzmick, industrial consultant, in discussing the application of hot-pressing techniques to powdered metals, described the recent development by a company of hot-press applications for heavy metal products. The compounds

SEES BRIGHT FUTURE AHEAD

consist of about 90 pct tungsten and 10 pct nickel-copper binder, with a theoretical density ranging from 16.5 to 17.2. Cold-pressing has been generally used, but may result in as much as 20 pct shrinkage. For hot-pressing, graphite molds are used with coating applied to the mold interior to prevent carburizing. The coating protects the mold as well as allowing a number of pressings from the same mold.

Use of the hot-pressing technique has produced a smaller crystal size in the product, due to the relative speed of the hot-press cycle, full density can be achieved easily. Another advantage: Hot-pressing has produced parts that formerly required machining away 50 pct of the tungsten alloy to reach the desired contour.

But cost is still too high

Production men attending the conference were quick to point out, however, that hot-pressing is still expensive—expensive enough to keep it out of the production stage. For expensive metals or parts—high cost items where cost could be absorbed—it might be used. Production lines, however, would still depend on cold press techniques.

The word from abroad indicated that powdered metal methods were advancing somewhat more rapidly than their application in use, particularly in high temperature work. Sweden continued to be a leader where production seemed to be climbing — Germany was again coming in. Great Britain was moving ahead research-wise, but English business men have been somewhat slow to adapt the material.

Alloy stronger at high temperatures

Mr. Kuzmick, president of Welded Carbide Tool Co., in discussing new research in powdered metal applications, pointed out that considerable time, money, and energy are going into uses of high temperature materials. From working toward a hot-pressed product that would have properties similar to the same alloy when prepared by forging, techniques have now advanced to the point where introduced materials and grain orientation can be produced that cannot be obtained in a forged alloy.

New methods have produced an alloy with over five times the stress-rupture life at high temperatures over forged material. It is possible that here would lie the answer to the present high cost of hot-forging methods.

W. D. Jones, director of Powder Metallurgy Ltd, London, in covering metal powder work abroad, indicated the interest there in high temperature materials. Molybdenum, tungsten, tantalum, and zirconium (the latter is not actually a powder metallurgy product) are being worked. Recent developments include production of slip cast molybdenum shapes. Hot-pressing of large molybdenum ingots is being investigated and sintered hard metal and extruded rods, tubes and bullets are in regular production.

Using ceramal dies, an increase in die life and 10 pct in extrusion speed have been obtained in extrusion of light alloy sections. While high frequency dust cores have been produced by a number of English companies, development is now being emphasized in the direction of low frequency dust cores for possibly extensive power applications.

Magnetic powder cores described

Eberhard Roth of the Signal Corps Engineering Laboratories at Fort Monmouth, N. J., reported on research being done by the Army on magnetic powder cores for communication equipment. His findings were the result of recent Ordnance tests, with higher operating temperatures the trend as communications equipment becomes smaller. It was indicated that some grades of carbonyl iron powder break down abruptly in Q values at temperatures above 200° C.

The implication in this report and a test report on temperature coefficients of permeability suggested that Signal Corps core specs might be changed, and that new specs might be more stringent in range of material types used.

Two strikes shadow industry

General tenor of the meeting was strongly hopeful. Powdered iron is not a particularly tough supply problem, copper is improving, tin is no problem, and bronze is improving. Shadowing the supply picture were two strikes—the steel strike as it might affect the supply for applying coatings of sintered material to a steel base—the Chilean copper strike as it might affect one of the larger suppliers of copper and copper alloys. At least two companies at the Chicago convention had recently been offered copper in excess of their allotments. The Chilean copper strike could change that.

Wide open valve production—

SMALL SHOP Sets up production machining line

By Walter Rudolph
Consultant
Erie, Pa.

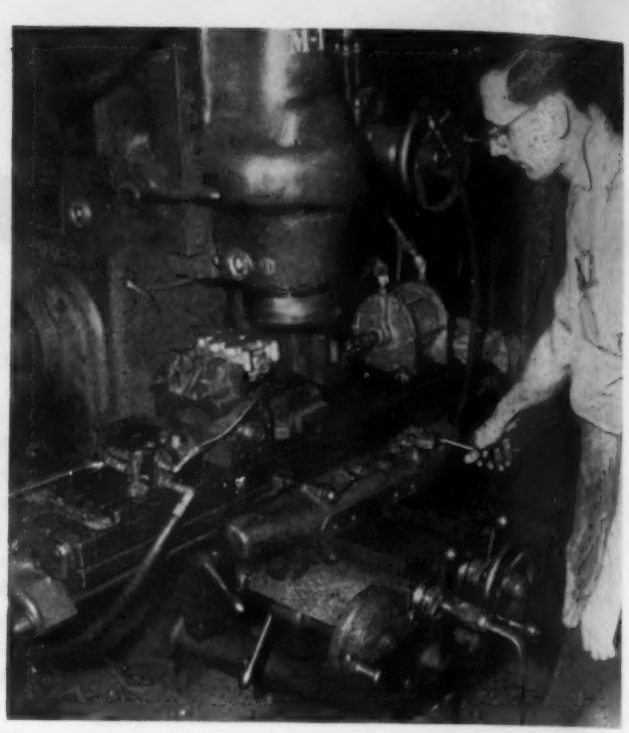


FIG. 1—First operation is milling of the base of the valve which is clamped in an air vise. Ten inch carbide cutter is used to mill base.

Low cost tooling specially engineered plus in-line arrangement of machines, conveyerized flow and fast clamping devices are producing valves at a record rate with a minimum of labor. Over 16 separate operations are performed continuously by four men on 15 machine spindles. Special locating plates and air vises permit speedy handling.

Special engineering and tooling, arrangement of machines, and several materials handling aids have been combined for efficient machining of 17-lb cast iron hydraulic control bodies, or valves, at The Parker Appliance Co., Cleveland, O. This is custom type work, for Parker clients who produce tractors, lift trucks and similar machinery and equipment with hydraulic controls.

Basically, the Parker setup is adaptable for the manufacture of almost any valve used in hydraulically operated vehicles; this makes the tooling noteworthy, since a minimum amount of labor is required. Over 16 operations are performed continuously by four men, using about 15 machine spindles.

In Parker's approach to the machining problem, materials handling was streamlined by making the machinery setup almost an in-line installation, installation of a roller conveyer and the use of special tote pan racks. Pin plates used throughout the operations are conveniently returned to the beginning of the machining line on the conveyer, skirting the rear of the machines. The special racks are a boon to visual inventory of bodies in process at various stages of machining, and to manual handling. Formerly seven bodies in a pan were a load to an operator; now 14 bodies fit into each of the rack pans. The rack resting on casters mounts five pans and is easily pushed about by the operator.

A two-spool body goes first onto a Milwaukee vertical miller, Fig. 1, using a 10 in. carbide cutter, for milling of the base. The body is clamped in an air vise. Locating is done on the two rough core diameters on each body side. Next in line, the body goes to a two-spindle Allen drill press and into a pump jig.

A quick-speed clamp is used to advantage in this jig; a pin bottom locater stops over-travel, the jig handle is slightly tightened, and the clamp shoved in and tightened with a near-full turn. So held, a multiple spindle Drill Head is used to drill 4 11/32 in. mounting holes in the body, Fig. 2, and the body is unclamped, moved to the next spindle for a tapping operation.

Next in line is a 3½ hp horizontal milling machine. The body is mounted on a pin plate,

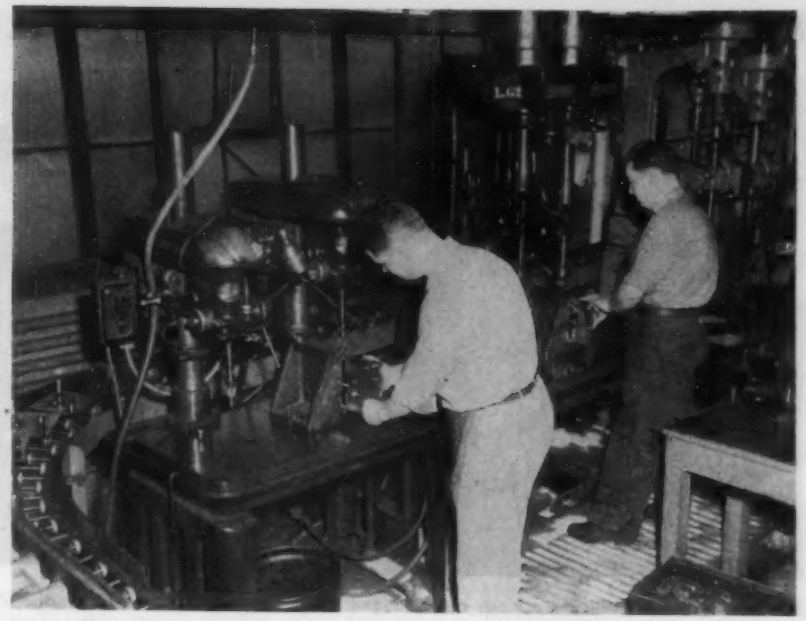


FIG. 4—Locating-plate held bodies move down the drilling and tapping line. Note the roller conveyer.

locating from two mounting holes and milled base. Two 10-in. cutters straddle mill the body, combined with a 2½-in. cutter that mills the stamping area on the body top. This is all done in one pass.

Just a few steps from the above operation is a Warner-Swasey No. 3 turret lathe where two piston bore operations are performed. The body is placed in a face plate fixture, locating on two pins, and clamped with a Snap-on speed wrench. One port in the body is then ready, on center, for four operations: core drill, two counter bores, holding to 0.001-in. tolerance; straight fluted reamer. The other bore can be run on another lathe; or re-clamping, run on this machine.

To the right of this turret lathe, Fig. 3, is a small work table where the body now goes into a pin plate that will carry it through subsequent operations in this setup. Handling between operations can be reduced to a minimum due to the elimination of loading, and unloading of the body on its locating plate. Once on the straight line for the remaining work, steel troughs or slides between machines expedite handling.

In the pin plate, on the production line, the operators slide the plate in and out of fixed holders.

Riser blocks and spindle adjustments compensate for using the same holders on various machines, such as Delta and Allen drill presses.

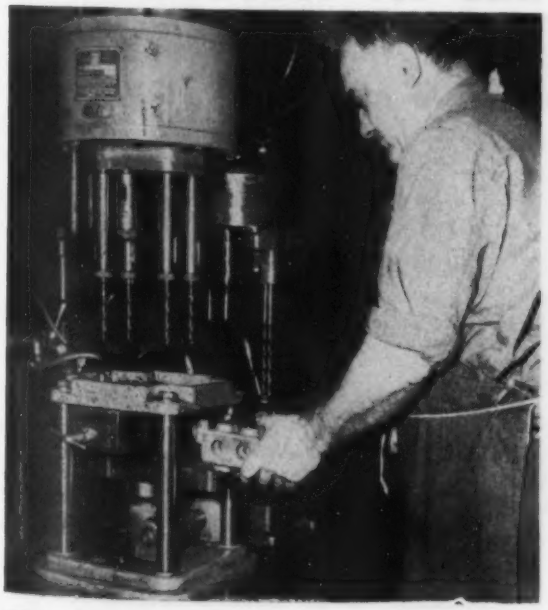


FIG. 2—Two spindle drilling employs a quick-speed clamping jig with a pin bottom locater.

FIG. 3—Work is mounted on a locating plate that carries it thru subsequent machining operations.

Machine work dovetails—

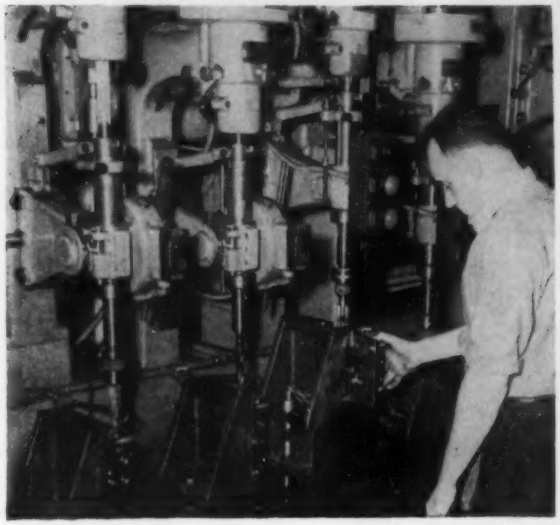


FIG. 5—Cycles of drilling machines are arranged in 15, 20, 30 & 40 sec intervals and are semi-automatic so that two men handle the two 4-spindle drill presses.

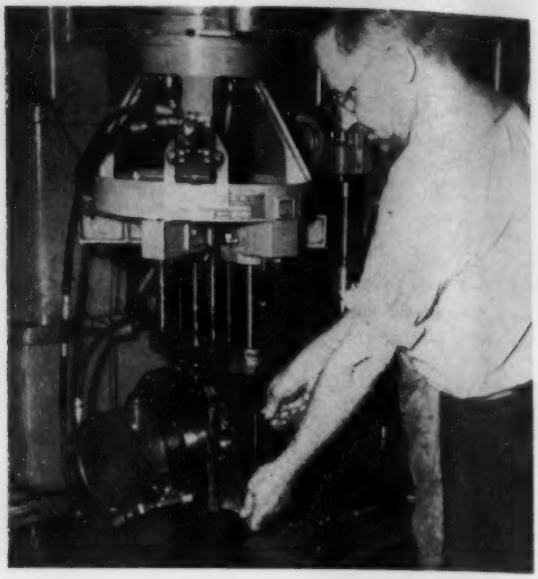


FIG. 6—Automatic air indexing machine used with a multiple-spindle drill head handles drilling of mounting plate holes in the hydraulic cylinder body.

This is the phase of the whole machining picture where several men, moving from machine to machine as required, keep the pin plate-held bodies moving down the line, step by step. At the first four machines, a core hole is rough drilled, then tap drilled for a pipe port, Fig. 4, then tap drilled for a larger pipe port, and semi-automatically tapped.

Succeeding operations are too similar to list here, but the aptness of the equipment and methods used can be visualized in the line-up of operations on two four-spindle Allen drill presses, Fig. 5, where operations are running 15, 20, 30 and 40 sec, semi-automatically, and are grouped so that two men can dovetail all work. Cycles of the spindles are arranged to keep the operators working at all times, while the spindles may finish their cycle and wait for the operator.

Another interesting and efficient setup is where an Allen mounts a multiple-spindle drill head used in conjunction with an automatic air-indexer, Fig. 6, to drill end cap mounting plate holes. These holes, 1⅜-in. deep, are drilled automatically, indexed twice 90°, and drilled on the other side of the body.

Jet Piercer CUTS HOLES IN TACONITE

Cutting primary blasting holes in taconite has been considerably simplified with a new jet piercer that eats its way into hard taconite and other rock formations at high speeds.

The jet piercer, developed by Linde Air Products, blasts combustion gases into rock and ore at the supersonic speed of 6000 ft per sec. Put to work on taconite the piercer eats downward at rates of 60 ft per sec.

Here's how the piercer works. Kerosene and oxygen are burned in a water cooled combustion chamber. The high velocity combustion gases hit the rock face. Heat expands the surface layer so rapidly it breaks away exposing another layer of rock which in turn breaks away.

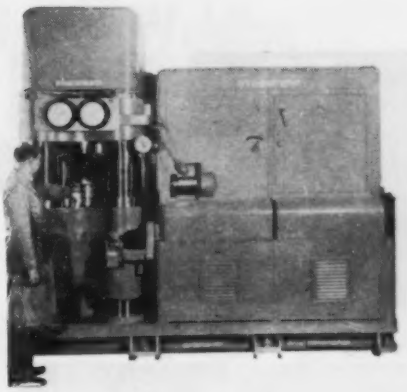
The jet blast blows spallings out of the path of the flame. Water used to cool the combustion chamber is discharged from small jets in the head. As the water hits the hot side walls, the water bursts into steam. This and action of the jet help blow small broken pieces out of the path of the flame.

JET PIERCER mounted at base of overhead cable rig blasts holes in taconite at supersonic speeds.

NEW equipment

New and improved production ideas, equipment, services and methods described here offer production economies . . . fill in and mail postcard on page 135 or 136.

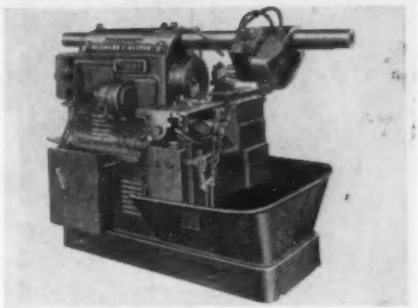
Machines use flexible pressurized die member



New metal forming machines, known as Hydroform, operate on the principle of a solid punch member moving into a flexible, hydraulically pressurized die member—actually an oil cavity capped with a flexible diaphragm. Sheet metal between these two members is hydraulically formed to the shape of the punch. In operation, the flexible die member is lowered and locked, initial pressure is released, and then the punch member moves upward into the flexible die member. The blank is pressed tightly against the draw ring surrounding the punch, to control metal flow. As the punch moves up, pressure is automatically increased on the blank being formed, and the metal is subjected to uniform pressure from all sides. Matching die sets are not necessary. Machines are available in 12 and 16-in. sizes. *Cincinnati Milling Machine Co.*

For more data circle No. 17 on postcard, p. 135

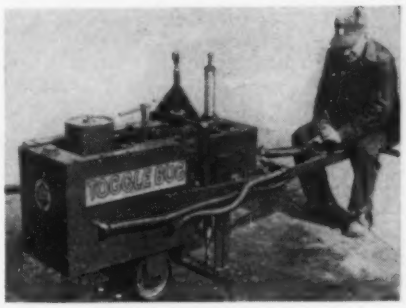
Cutoff lathes permit quick change in setup



Two cutoff lathes with 3 and 4-in. diam capacities have electric remote control that permits automatic cutoff to any length. Spindle speeds range from 85 to 1100 rpm with four quick changes. A pair of reversible pick-off gears makes available a total of eight speed changes. Independent hydraulic systems are used for the cutoff slides and collet chuck operations. Since no cams are used, a complete change in setup from one size and length of work to another is said to be made in less than ½ hr. A new stock feed table operates automatically. *Bardons & Oliver, Inc.*

For more data circle No. 18 on postcard, p. 135

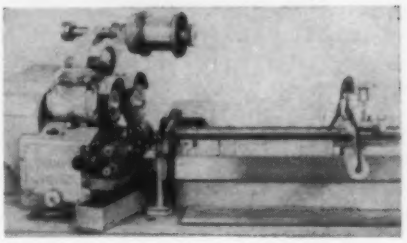
Air powered drill handy for field operation



A new Togglebug drill is made with a standard, air motor capable of variable spindle speeds ranging from 150 to 600 rpm. It operates on 100 lb pressure and consumes 150 cu ft of air at maximum load. A ¾-in. line is recommended to provide adequate air supply for efficient operation. The new model meets the demand for drilling, reaming, and countersinking up to 2¼ in. using air power and will be especially useful for field operation where electric power is not available. *Guibert Steel Co.*

For more data circle No. 19 on postcard, p. 135

Synchronized rolling action features wire coiler



Fast, uniform, accurate coiling without damage to wire is claimed for a new resistance wire coiling machine. It embodies synchronized rolling action of all coiling parts. Wire of different sizes can be coiled with maximum uniformity, without the wire being scored or misshapen. Pin-point precision of a photoelectric cell cutting knife control assures each coil being cut to the length required. *Driver-Harris Co.*

For more data circle No. 20 on postcard, p. 135

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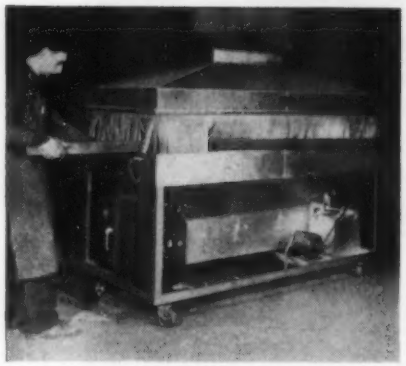


Electric furnace heats aluminum bars

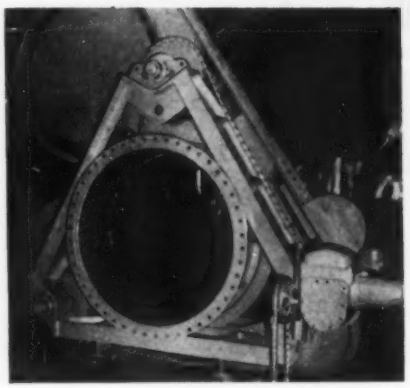
To heat special aluminum bars to approximately 300°F, prior to forming operations, a new portable electric furnace has been introduced for the work. The new unit, having an oven size 3 ft wide x 6 ft long x 8 in. high, is equipped with a blower to produce proper recirculation of the heated air. A semi-closed opening for feeding and discharging the long bars is provided by means of an asbestos strip curtain. The unit is mounted on rollers for moving to immediate location of the following forming operation. Controls include temperature indicator and controller, instrument transformer, magnetic contactor. *Pereny Equipment Co.*

For more data circle No. 21 on postcard, p. 135

80-cu ft hopper on electric truck

A new 4000-lb-capacity high-lift platform truck has an extra-large end-dump hopper, designed for handling bulky loads of loose material such as sand, gravel, aggregate, metal chips, and scrap. The hopper can be tilted downward to scoop up loads, or it can be loaded from overhead. A shortened platform accommodates the hopper and the platform elevating mechanism is used to dump it. *Yale & Towne Mfg. Co.*

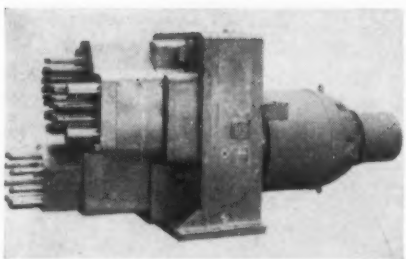
For more data circle No. 22 on postcard, p. 135



Goggle plate valves for large diameters

Electrical operation and pushbutton control are new features of Brosius-Westling goggle type plate valves for large diameter blast furnace and coke oven gas mains. Two heavy-duty electrical units incorporated in the design control and operate both the plate swing in the valve and the opening and closing of the valve proper. These assure easy operation, sure closing, and positive positioning of the valve in all sizes ranging from 36 to 108 in. diameter. Operating on 220/330 or 440/550 v plant power, the unit has a speed reduction of 170:1, a running output torque at 10 rpm of 425 ft-lb, and a built-in hammer blow arrangement for loosening parts set by scale or rust. *Salem-Brosius, Inc.*

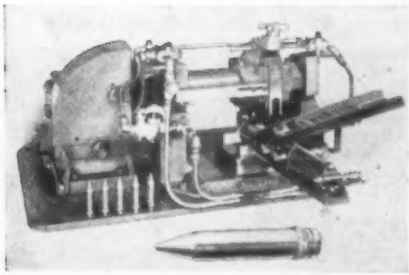
For more data circle No. 23 on postcard, p. 135



38-spindle individual lead screw tapper

A special tapping head operates in conjunction with two additional lead screw tapping heads on a three way machine. Individual lead screw tapping heads can tap holes regardless of different threads, fine or coarse, small or large diameters, in the same head as each tap has its own lead screw, the lead of which is identical with the tap. Each spindle of the head is furnished with a safety tap holder. *U. S. Drill Head Co.*

For more data circle No. 24 on postcard, p. 135



Motor-driven, air-feed machine marks shells

A motor driven marking machine includes air-feed and ejector as an integral part of the equipment. Machine marks cylindrical parts such as shells, cartridges, drills, pins, shafts, tubular parts. Parts are rolled into feeding position down a gravity chute, and at each stroke of the machine, pushed into marking position by an automatic plunger. Motor drive is a gear-reduction motor furnished for 110 to 220 v, 60 cycle ac connection. *Acromark Co.*

For more data circle No. 25 on postcard, p. 135

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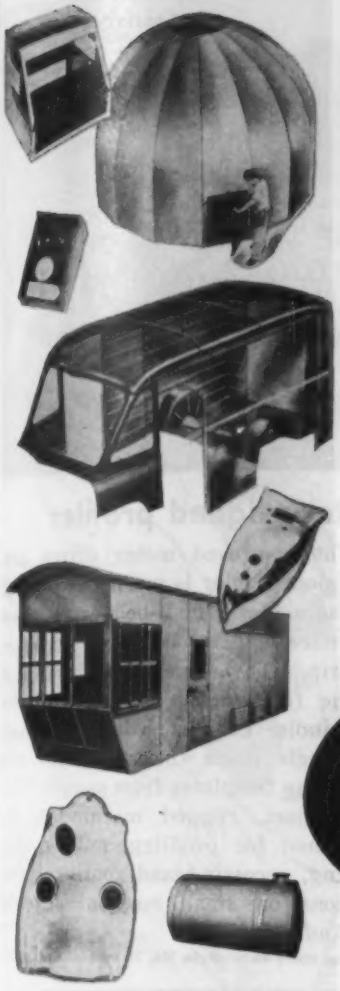

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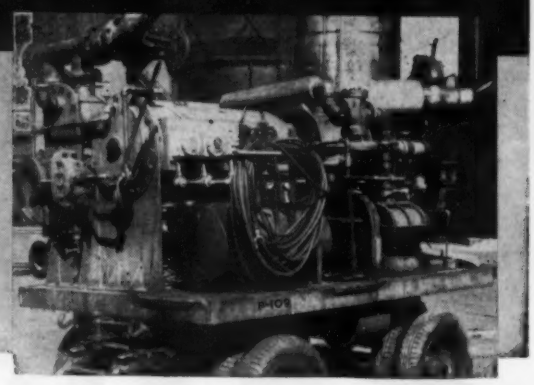
GUARD AGAINST EXPLOSION with R-C INERT GAS GENERATORS



Portable R-C Inert Gas Generator used for purging operations and stand-by protection in large gas-producing plant. Capacity 15,000 cfh.

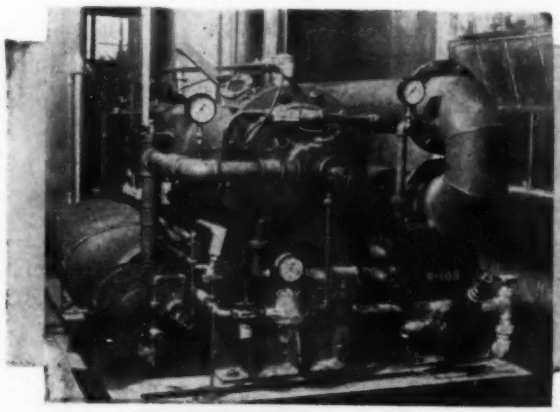
If your operations involve materials or processes which might cause an explosion-produced fire, you can reduce the risk with R-C Inert Gas Generators. In many instances, the relatively small cost is absorbed by savings in insurance costs.

These mobile or stationary units instantly produce a continuing flow of inert gas, for use in purging gas or liquid lines, blanketing dangerous areas and for many other industrial uses involving the handling or storage of explosive materials.

R-C Inert Gas Generators are compact, simple and inexpensive to operate, with either oil or gas as fuel. They are available in capacities from 1,000 cfh to 50,000 cfh, with characteristics to match specific requirements.

Where even a relatively low explosion hazard exists, one incident might produce a disastrous fire. Ask for details on how such dangers may be averted with R-C Inert Gas Generators.

ROOTS-CONNERSVILLE BLOWER CORPORATION
526 Ohio Avenue, Connersville, Indiana



Installation of three R-C Inert Gas Generators similar to this one helped one large plant save $6,000 per month insurance premiums, as well as substantially reduce danger of production losses caused by explosion or fires. Capacity of each unit, 6,000 cfh.

Reg. U. S. Pat. Off.

ROOTS-CONNERSVILLE
BLOWER BUILDERS SINCE 1854
ONE OF THE DRESSER INDUSTRIES

Redesigned profiler

The improved motor driven precision profiler is much heavier, and has a powerful V-belt drive. New cutter holder collets have improved grip. The same collet is used in the follower spindle. A follower spindle parallel with the main spindle holds the cutter for producing templates from sample. This compact, rugged machine is designed for profiling, milling, slotting, recessing and routing operations on small mechanical parts. *Wade Tool Co.*

For more data circle No. 26 on postcard, p. 135

Bearing balls

Identified as Se-Jector gaged, a new line of bearing balls have matched accuracy that improves bearing performance, speeds up assembling and reduces assembling costs. Each individual ball is subjected to a sequence of multiple gaging which not only selects balls in closely matched tolerances, but rejects any ball lacking the required sphericity as well as any with flats so tiny as cannot be detected with less sensitive devices. *Pioneer Steel Ball, Inc.*

For more data circle No. 27 on postcard, p. 135

Die cushion lubricant

A specially compounded lubricant for pneumatic die cushions assures maximum life to the cup packings on the die cushion cylinders, and the proper lubrication through the cylinder and piston, including other working parts. Free sample is available when requested on own letterhead. *Dayton Rogers Mfg. Co.*

For more data circle No. 28 on postcard, p. 135
Turn Page

POP'S school of filing

STEP UP, BOYS, AN' SHAKE HANDS WITH AN OLD FRIEND O' MINE! 'CASE YOU DIDN'T KNOW IT, HE'S ONE O' YOUR BEST FRIENDS, TOO!
SMART LOOKIN' FELLER — WHO IS HE?
SALESMAN FROM TH' INDUSTRIAL SUPPLY HOUSE. HE'S TH' GUY WHO GIVES US DOUBLE-QUICK DELIV'RIES WHEN WE NEED FILES!
STAN RANDALL

Ask Pop or any other experienced shop foreman what he thinks of the industrial distributor. He'll tell you the plant couldn't run without that dependable source of supply.

Who else has the tools, machines, parts, supplies and accessories you need, conveniently near and ready for fast shipment? Who else has the broad experience and product know-how to give your shop first-aid in production problems?

Your industrial distributor relieves you of a lot of headaches. He takes over the time-consuming work load involved in scattered direct-buying contacts. He expedites purchase orders and deliveries. He warehouses reserves that would otherwise tie up your own capital.

He knows more about a wider range of tools for industry than any one manufacturer can know. And he's always ready to help your men keep abreast of mechanical improvements and new techniques.

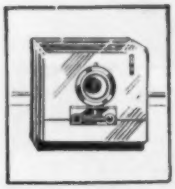
Take files: Your industrial distributor stocks a big assortment of all regular types, cuts and sizes, as well as many special types for special purposes and materials. His expert judgment in picking *The right file for the job* is of incalculable assistance on both exacting and mass-production work.

Marketing through distributors is a policy that has made Nicholson files and Nicholson quality available to industrial file users from coast to coast.

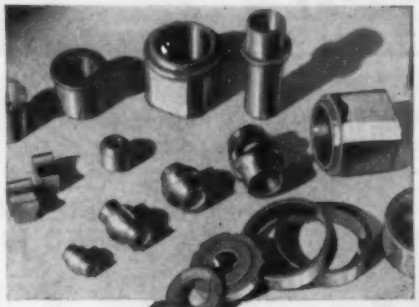
NICHOLSON FILE CO. • 31 ACORN STREET • PROVIDENCE 1, RHODE ISLAND
(In Canada, Port Hope, Ont.)

NICHOLSON ... A FILE FOR EVERY PURPOSE

Ideal for certain applications



Washers

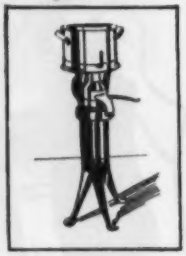


Electric Motors

Cream Separators

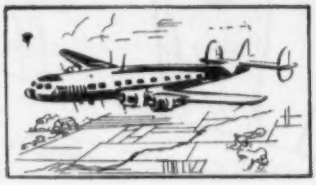
Cotton Pickers

JOHNSON Ledaloyl SELF LUBRICATING **BEARINGS and parts**



Business Machines

Automobiles



Airplanes

THESE low cost, porous, self-lubricating bearings may be the answer to some of your bearing problems. If so, you will make substantial savings. Johnson Ledaloyl Bearings and Parts are molded under high pressure from powdered metal . . . no machining necessary . . . hence the low unit cost in large quantities. Some industrial applications are: places difficult or impossible to lubricate, uses where heavy duty service is not a factor, installations requiring self-aligning bearings, and others. New uses are being discovered every month. Johnson engineers will gladly help you to determine whether you can use Ledaloyl bearings to your advantage. Write today.

Popular sizes of straight, flanged and self-aligning bearings available from stock. Write for catalog.

JOHNSON BRONZE COMPANY
505 South Mill St., New Castle, Pa.

JOHNSON B BEARINGS
Sleeve-Type

—New Equipment—

Continued

Electric tank heater

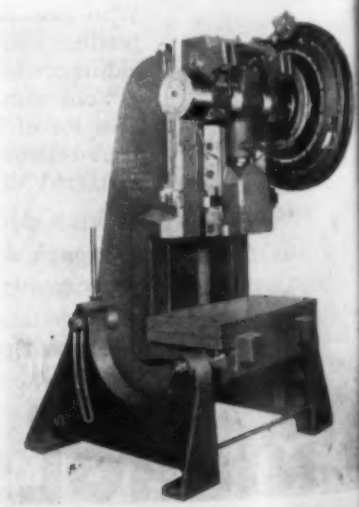
Improvement of two Chromalox industrial electric heaters used in the chemical, plastics, paint, metalworking, and finishing industries consists of a vapor-tight terminal box as standard feature. Heavy duty Chromalox tubular elements are welded to the sealed, electrical connection housing and the wiring is brought out to the terminal box through a thick-walled steel pipe. Units are available in steel, alloy, or stainless with ratings from 3 to 7.5 kw. *Edwin L. Wiegand Co.*

For more data circle No. 29 on postcard, p. 138

Inclinable power press

A feature of a new open back inclinable power press of 60-ton capacity is the heavy duty one-piece special alloy frame with built-in tie-rods of high tensile steel. Tie-rods provide extra reinforcement to the gap of the press, eliminating deflection, binding or misaligning of dies on heavy work and permitting a larger die space with no sacrifice in weight. Model 60 Press-Rite has the Airflex clutch and brake system. Brake and clutch cannot be engaged simultaneously; drag and excessive heating is eliminated. Available in back-geared or flywheel types. Bolster area is 21x32 in.; depth of throat, 11 in. *Sales Service Machine Tool Co.*

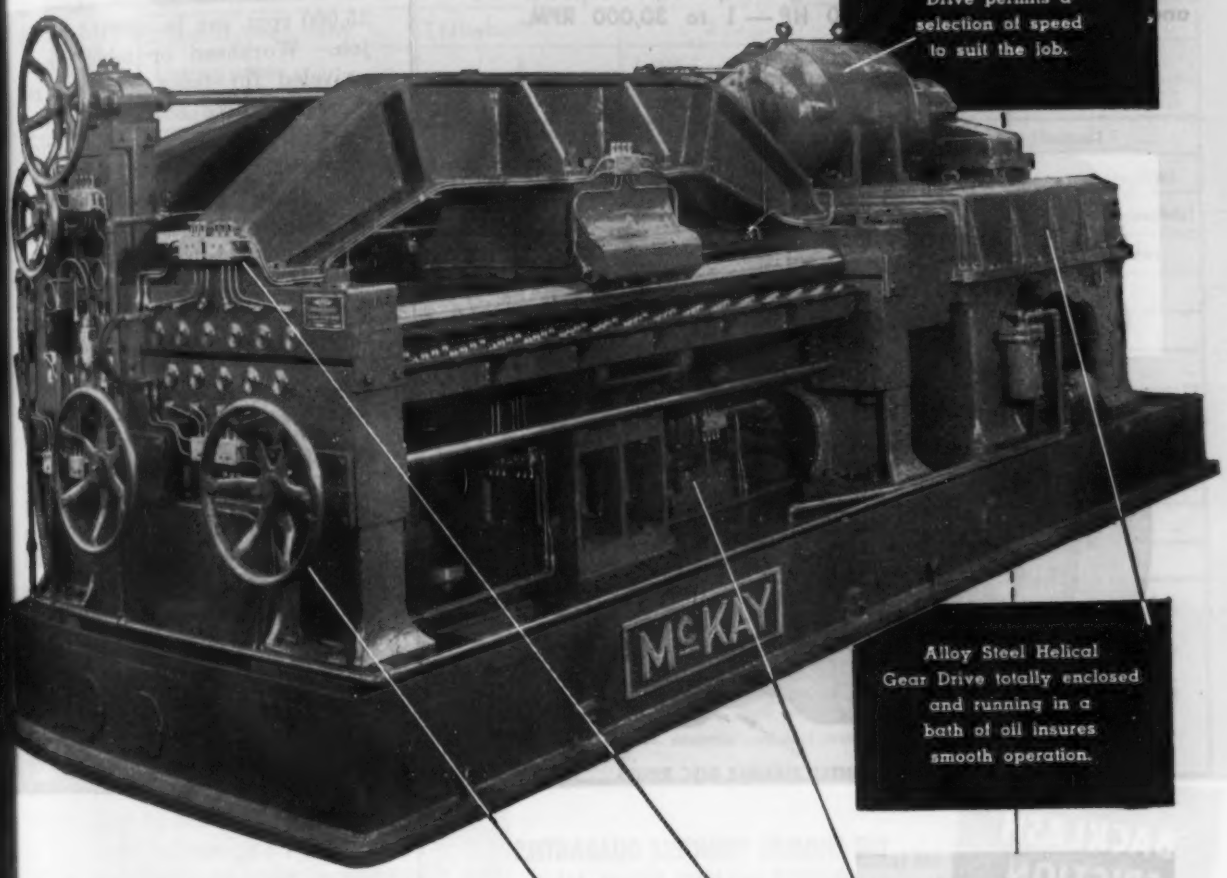
For more data circle No. 30 on postcard, p. 138



Turn Page

why do McKay Machines

LAST LONGER ?



Multi Speed Motor Drive permits a selection of speed to suit the job.

Alloy Steel Helical Gear Drive totally enclosed and running in a bath of oil insures smooth operation.

Rugged construction consistent with steel mill design permits continuous operation with a minimum of down time.

One shot system provides correct lubrication for all moving parts.

Compact design with all adjustments easily accessible to the operator.

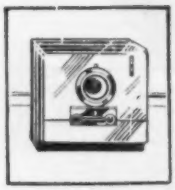
■ The McKay Flex Roll Sheet Processor is universally accepted by the automotive and stamping industries for eliminating stretcher strain and reducing scrap loss due to breakage in die drawn parts. The Processor combines a deep flex rolling under tension and a thorough cold working of the steel sheet by roller leveling, to condition it for deep drawing operations.

McK McKAY

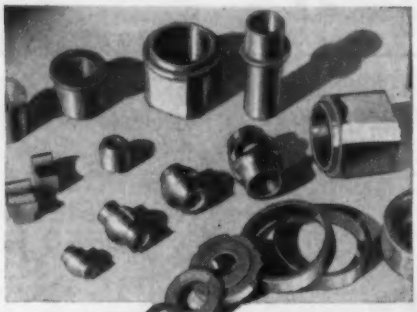
The McKAY MACHINE Company

YOUNGSTOWN, OHIO

Ideal for certain applications



Washers



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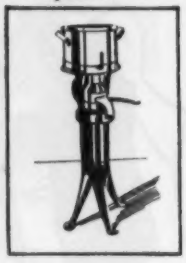
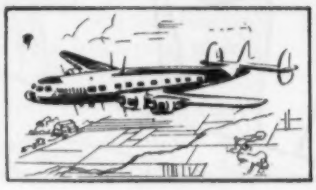
JOHNSON
Ledaloyl
SELF LUBRICATING
BEARINGS and parts



Business Machines

Automobiles



Airplanes

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Popular sizes of straight, flanged and self-aligning bearings available from stock. Write for catalog.

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—New Equipment—

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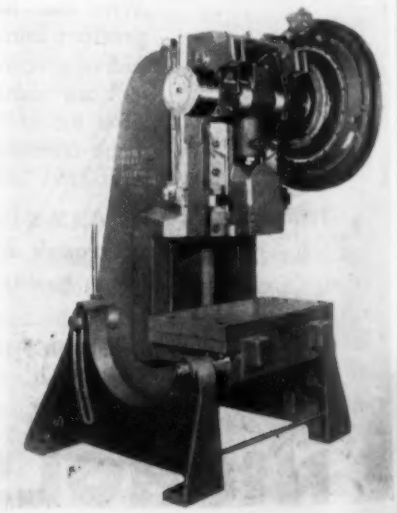
For more data circle No. 30 on postcard, p. 135



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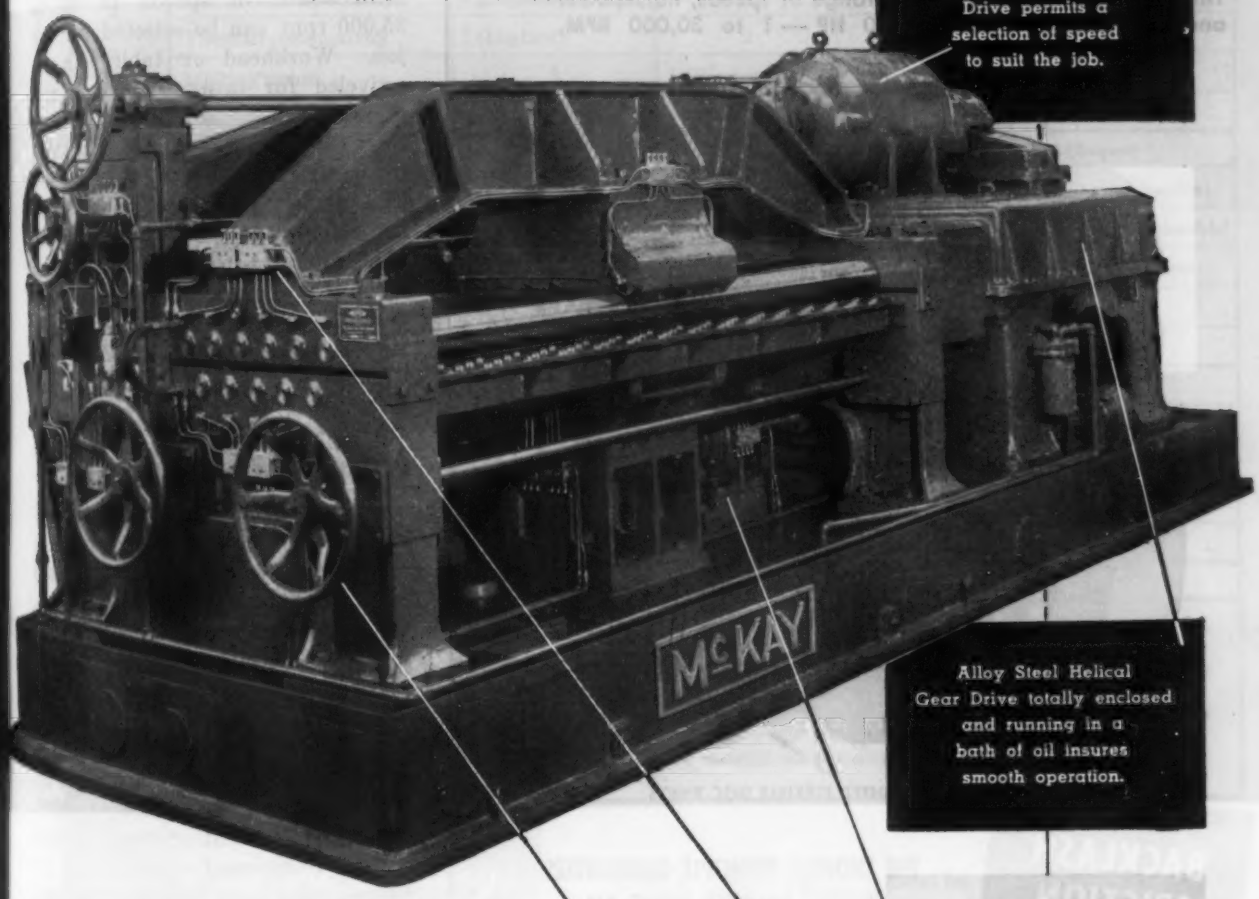
why do McKay Machines

LAST LONGER?



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One shot system provides correct lubrication for all moving parts.

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McK McKAY

The McKAY MACHINE Company

YOUNGSTOWN, OHIO

THOMAS *Flexible* ALL METAL COUPLINGS

FOR POWER TRANSMISSION • REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings have a wide range of speeds, horsepower and shaft sizes: ½ to 40,000 HP — 1 to 30,000 RPM.

Specialists on Couplings for more than 30 years

PATENTED FLEXIBLE DISC RINGS

BACKLASH FRICTION WEAR and CROSS-PULL are eliminated LUBRICATION IS NOT REQUIRED!

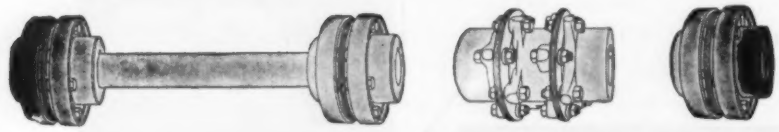
THE THOMAS PRINCIPLE GUARANTEES PERFECT BALANCE UNDER ALL CONDITIONS OF MISALIGNMENT.

• • •

NO MAINTENANCE PROBLEMS.

• • •

ALL PARTS ARE SOLIDLY BOLTED TOGETHER.



Write for the latest reprint of our Engineering Catalog.

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

Small hole grinder

Featuring flexibility of operation, a new small hole grinder has interchangeable motor-driven wheel heads for internal and external spindles. The correct internal spindle with removable arbor, with chuck for mounted wheels, or with solid shaft, in speeds 12,000 to 35,000 rpm, can be selected for the job. Workhead or table can be swiveled for taper grinding; micrometer table stop can position work exactly for shoulder grinding, using fine hand table travel. The model 84 grinds holes from the smallest up to 3-in. diam, with a maximum 4-in. depth, depending upon the diameters; it grinds externally up to 3-in. diam with a length of 4 in. *Rivett Lathe & Grinder, Inc.*

For more data circle No. 31 on postcard, p. 135

Hard water scale

New, non-chemical water treatment process and equipment eliminates hard water scale problem. Called Hydroton, the process changes water electro-physically, so that minerals contained in the water crystallize out in the form of sludge or slurry and do not form a dense hard coating over heat exchange surfaces. Sludge can be removed by blowdown methods. Process is suitable for treatment of fresh or salt water. Equipment consists of bronze pipe unit installed in the water supply line, and an electrical control unit mounted nearby. *Heller Laboratories.*

For more data circle No. 32 on postcard, p. 135

Detachable link belt

Detachable V-link belt is prestretched, will not slip, and can run in either direction. Links are uniform in camber and dimension, and made from tough woven cloth impregnated with top grade heat and oil resistant crude rubber. Convex stud head assures greater strength and longer service life. Non-slippage feature is due to high coefficient of friction and a perfected wedge action. *Brammer Co.*

For more data circle No. 33 on postcard, p. 135

Turn Page

Selection Factor in Choosing Alloys for Die Castings

		Aluminum Alloys ASTM Nos. S5, SC2	Brass	Magnesium Alloys ASTM Nos. 12 and 13	Zinc Alloys ASTM Nos. 21, 23, 25
Mechanical Properties	Tensile strength	3	1 (Strongest)	3	2
	Impact strength	3	1 (Toughest)	3	2
	Elongation	4	1 (Most ductile)	3	2
	Dimensional stability	2	1 (Most stable)	3	3[a]
	Resistance to cold flow	2	1 (Most resistant)	2	3
	Brinell hardness	3	1 (Hardest)	3	2
Physical Constants	Electrical conductivity	1 (Highest)	2	3	2
	Thermal conductivity	1 (Highest)	2	4	3
	Melting point	2	1 (Highest)	2	3
	Weight, per Cu in.	2	4	1 (Lightest)	3
Casting Characteristics	Ease, speed of casting	2	3	2	1 (Easiest)
	Maximum feasible size	1 (Largest feasible)	2	1 (Largest feasible)	1 (Largest feasible)
	Complexity of shape	1 (Greatest possible)	2	1 (Greatest possible)	1 (Greatest possible)
	Dimensional accuracy	2	3	2	1 (Most accurate)
	Minimum section thickness	2	3	2	1 (Thinnest)
	Surface smoothness	2	3	2	1 (Smoothest)
Cost	Die cost[b]	2	3	2	1 (Lowest)
	Production cost	2	3	2	1 (Lowest)
	Machining cost	2	3	1 (Lowest)	1 (Lowest)
	Finishing cost[c]	3	2	3	1 (Lowest)
	Cost per piece[d]	2	3	2	1 (Lowest)
Extent of Use		2	4	3	1 (Most used)

Source: Materials & Methods

[a] *Through the use of a low temperature annealing treatment, Alloy No. 23 can be made virtually stable in dimensions.*

[b] *Dies for casting the low melting point alloys are least expensive and have longest life.*

[c] *Includes polishing and buffing expense as well as ease of applying all types of commercial finishes, both electrodeposited and organic.*

[d] *Based on die, material and fuel costs, production speed, machining and finishing costs.*

ZINC is the most adaptable metal for the die casting process and provides the best combination of physical and chemical properties. Zinc die castings are stable, strong, and can be cast to close tolerances; they are easily machined and a large variety of beautiful metallic and organic finishes can be readily applied to the castings. Industry's recognition of these factors is indicated by a two-hundred-fold increase in the use of zinc die castings in the last ten years, plus the fact that nearly 70% of *all* die castings by weight are made of zinc.

DIE CASTING is the Process • ZINC, the Metal • BUNKER HILL, the Preferred Zinc

Eastern Sales Agents: **ST. JOSEPH LEAD CO., 250 PARK AVE., NEW YORK 17**

BUNKER HILL 99.99+% ZINC

Sales Office for Pacific Coast: **NORTHWEST LEAD CO., SEATTLE, WASH.**

"No Use Going Out There
...THEY BURNED OUT LAST NIGHT!"

BAD NEWS for employees and the community. Bad news for management, too—especially if it has to explain why the fire protection it provided was too little or the wrong kind!

Too many bad fires result from not recognizing one thing: *not all fires are alike.* In most plants there are key operations where crippling fire can hit hard and fast. For these, ordinary fire protection is often hopelessly inadequate.

CARDOX originated "Low Pressure Carbon Dioxide Systems"* years ago to make extra-dangerous hazards safe. Applying CARDOX CO_2 tons-a-minute as readily as a few pounds, these Systems for one or many hazards keep small fires *small* and sudden big fires from becoming disasters. They hold fire damage to a minimum—and eliminate extinguishment damage entirely!

You'd be surer of uninterrupted production with this kind of protection in your plant. A survey by CARDOX—backed by the experience of thousands of installations and an unequalled knowledge of low pressure CO_2—will show you how easily you can write off fire as a major threat.

We'll arrange a survey if you'll kindly write us.

*Covered by Patents Issued & Pending

CARDOX
ORIGINATOR OF Low Pressure CO_2
FIRE EXTINGUISHING SYSTEMS

CARDOX CORPORATION • BELL BUILDING • CHICAGO 1, ILLINOIS
Offices in Principal Cities

—New Equipment—

Continued

Drop bottom container

New drop-bottom container saves time, labor and worker fatigue. It operates with a positive counterweight handle that opens easily. Drop bottom permits gravity flow to bring parts directly to the operator's work point. Sides are solid from top to bottom. Containers stack and can be used for storage purposes. Drop bottom opening is 13 in. high x 31½ in. wide. *Roura Iron Works, Inc.*

For more data circle No. 34 on postcard, p. 135

Magnetic probe

Magnetic probe, made of supermagnetic alloy, is no larger than a fountain pen. Point of magnet is extended or retracted from a case by turning end-knob. Strength of magnet can be controlled by amount of extension. Pocket clip is provided for safe easy carrying. *General Scientific Equipment Co.*

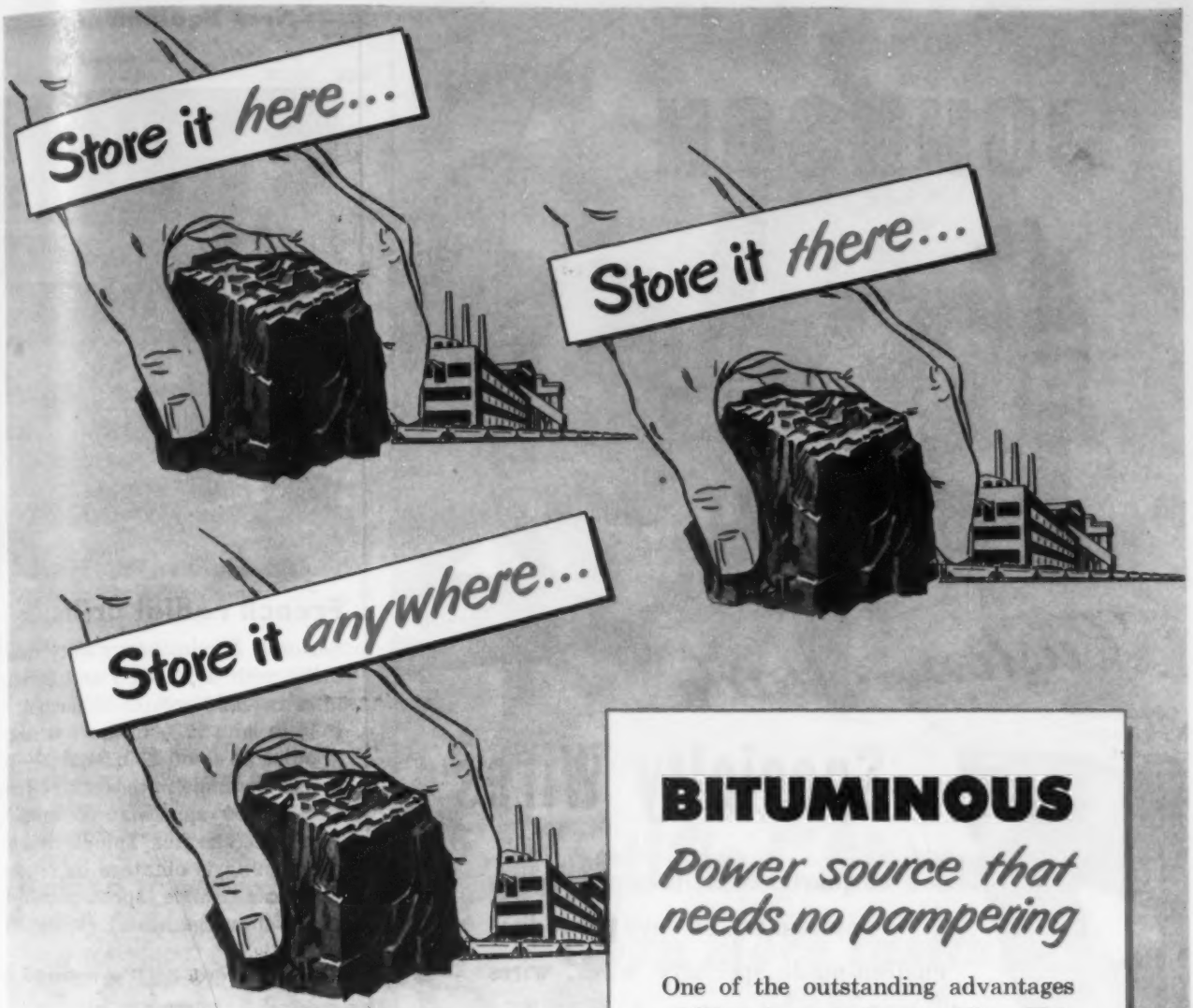
For more data circle No. 35 on postcard, p. 135

Milling machine

The Diamond 22M milling machine, said to have rigidity, precision, and capacity of larger and costlier machines has longitudinal travel of 14 in.; maximum vertical travel from center of spindle to table top 15 in.; and cross traverse, 5½ in. Full table working surface is 5¾ x 24 in. Spring loaded dials help in quick settings. There is an automatic kickoff on the power feed and a motor drive design arrangement for standard Nematype motors. *Diamond Machine Tool Co.*

For more data circle No. 36 on postcard, p. 135

Turn Page



BITUMINOUS

Power source that needs no pampering

One of the outstanding advantages of Bituminous is its *storability*. This dynamic, low-cost fuel can be stockpiled anywhere—in any volume. Construction of storage facilities is not required when fuel needs increase.

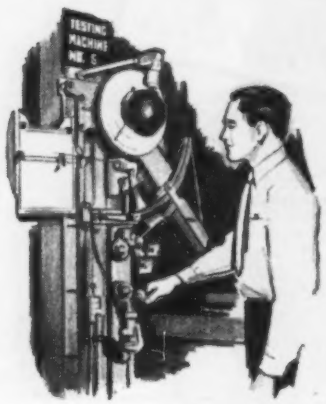
Add to this the *excellence* of Bituminous mined along the Baltimore & Ohio, the wide *variety* available, and its *accessibility* through convenient transportation to industrial centers—and you have ample reason for choosing B&O coals. For helpful advice, *ask our man!*

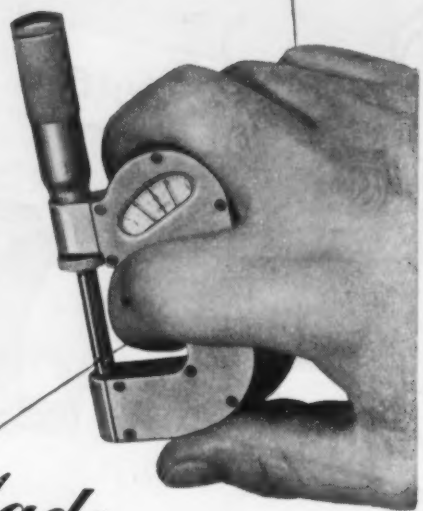
BITUMINOUS COALS FOR EVERY PURPOSE

BALTIMORE & OHIO RAILROAD

Constantly *doing things*—better!

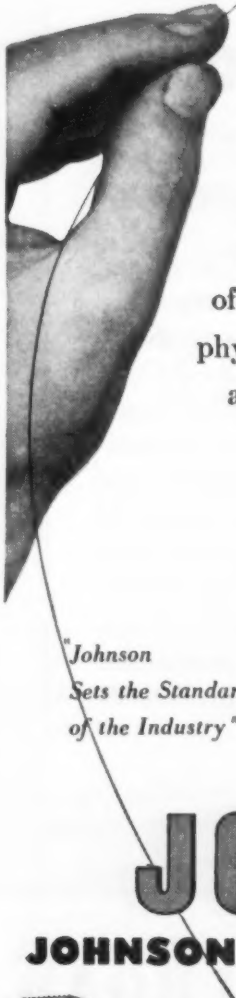
JOHNSON





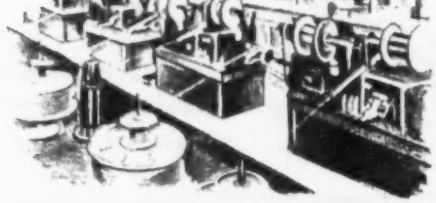
Custom-Made

Specialty Wires



A quarter of century of progress —new and better ways to produce custom-made specialty wires, wires of absolute uniformity of prescribed physical and metallurgical properties and drawn exactly to the size which best meets your requirements.

"Johnson Sets the Standard of the Industry"



JOHNSON

JOHNSON STEEL and WIRE CO., INC.

Worcester 1, Massachusetts

SUBSIDIARY OF PITTSBURGH STEEL COMPANY

French radial drills

Series L Maxim heavy duty radial drills with 4 ft 3 in. and 5 ft 10 in. arms and column diameters of 15¾ in. and 17½ in. have capacity in mild steel of 2 in. and 2½ in. Twenty spindle speeds range from 32 to 2500 rpm and 25 to 2000 rpm. Accelerated spindle reverse for tapping is obtained by friction clutches. Single speed motor is mounted on the head. *Parker Machine Co.*

For more data circle No. 37 on postcard, p. 135

Metal cleaners

Two cleaners used in preparing metal surfaces for finishing operations are: Divobond for phosphatizing iron and steel prior to painting, and No. 101 for electro-cleaning brass prior to plating. Divobond forms a thin, tough skin on iron and steel which retards rusting of the clean metal prior to painting, promotes better paint adhesion and prevents flaking and peeling. No. 101 is an alkaline material with detergent and emulsifying properties; will not stain or darken brass. *Diversey Corp.*

For more data circle No. 38 on postcard, p. 135

Protective creams

Three antiseptic protective creams available to industry are an oil resistant, water soluble bland vanishing cream for protection against dust-borne irritants, viscous oils, dirts, greases and grimes; a water resistant soft cold cream for pro-

tection against dilute acids and alkalis; and a solvent-resistant water soluble bland vanishing cream for protection against organic solvents, acetates and cooling and cutting oils of low water content. A sturdy polystyrene container dispenses a predetermined amount of cream with each lever stroke. *West Disinfecting Co.*

For more data circle No. 39 on postcard, p. 135

Wafer motors

Flat, compact design of the new Wafer motor permits simple, integral mounting in equipment. When used as a fan drive in air piping, it can be installed right in the vent with a direct connection being made between the fan and motor shaft. Wafer motors are quiet running, and are said to provide greater horsepower and speed per size than conventional motors. Available in ratings from 1/20 to 5 hp and in speeds from 450 to 3600 rpm, single phase or polyphase. *Reuland Electric Co.*

For more data circle No. 40 on postcard, p. 135

Surface temperatures

High precision measuring roll surface temperatures, from −40°F to +450°F is obtained with a new temperature measuring head, used in conjunction with a high speed Dynalog recording controller. The temperature-sensitive element is a miniature resistance bulb that lightly rides on the surface of the roll. It is mounted on a block of Marinite which isolates it from ambient temperatures. The unit, with its cast aluminum housing, weighs less than 1 lb. *Foxboro Co.*

For more data circle No. 41 on postcard, p. 135

All sizes graded to S.A.E. specifications

"Certified" Abrasives

clean more castings per dollar!

"Certified" Samson Shot and Angular Grit are made *extra-tough* by a special *automatically controlled* hardening process. They wear longer, can be used over and over again . . . actually clean more castings per dollar! Save money . . . switch to "Certified" Abrasives.

Experienced Foundrymen say:

Always specify "Certified"

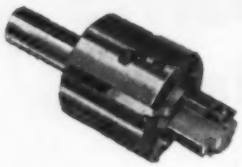
ACCEPTED AND USED FOR OVER 55 YEARS

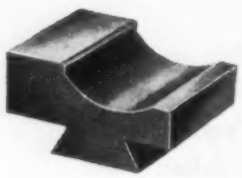
PITTSBURGH CRUSHED STEEL CO., Pittsburgh, Pa.

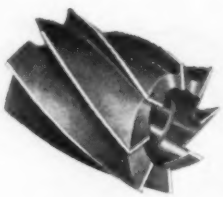
STEEL SHOT AND GRIT CO., Boston, Mass.

MEMBER FEMA

with Gorham-ENGINEERED SPECIAL CUTTING TOOLS







Next time you're up against a tough tooling problem, call in the man who can give you *the right answers fast* . . . your nearby Gorham Field Engineer! He's an expert in special cutting tools . . . and he's ready to provide a complete engineering service to determine your exact tooling requirements. He starts with your product, sketch or idea. He surveys your production operations and available equipment. He considers work material properties and desired finishes and tolerances. He plots proper machine feed, speed and method of tool driving. Then he develops practical design and engineering specifications for special cutting tools, metallurgically "tailor-made" for your application.

His recommendations are backed by Gorham's unmatched facilities, which include three fully-equipped modern plants, a large Engineering and Metallurgical staff, and a force of field application engineers in principal industrial centers, coast-to-coast. All are dedicated to furnishing prompt and profitable solutions to your special tooling problems. Gorham-engineered "specials" are turning problems into profits in thousands of plants every day . . . why not let them do the same for *you?* If you haven't met your nearby Gorham Field Engineer, write for his name, or send details of your problem direct for recommendations.

Gorham TOOL COMPANY

"EVERYTHING IN STANDARD AND SPECIAL CUTTING TOOLS"

14413 WOODROW WILSON • DETROIT 3, MICHIGAN

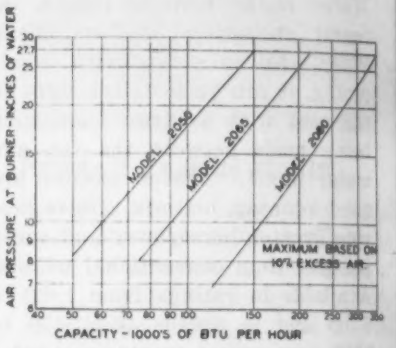
WEST COAST WAREHOUSE: 576 North Prairie Ave., Hawthorne, Calif.

Combustion:

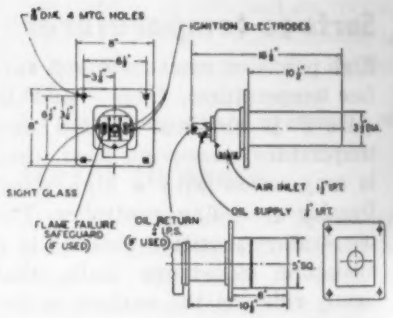
High velocity burner permits unusually high combustion efficiency.

A completely new and advanced technique in the burning of distillate fuel oils is provided by the Thermal high velocity burner. In one compact unit it represents a combination vaporizer, burner, and combustion chamber.

Combustion is so rapid within the burner that the exceptionally high heat release per unit volume of combustion space makes possible a reduction of as much as 75 pct in the overall size of heat equipment.


AIR PRESSURE AT BURNER - INCHES OF WATER
CAPACITY - 1000'S OF BTU PER HOUR
MODEL 2036
MODEL 2045
MODEL 2060
MAXIMUM BASED ON 10% EXCESS AIR

AIR PRESSURE at burner, measured in inches of water, shows sharp increase as capacity in btu's rises for each model.



BURNER IS MOUNTED in integrated unit. Ignition electrodes, flame failure safeguard, can be removed for adjustment.

Combustion Complete — Completely burned products of combustion emitted from the exit end of this burner can be at near-theoretical temperatures and are moving at velocities which provide convection heat transfer rates never before possible with conventional burner equipment.

The high velocity burner operates on standard accessory equipment and controls. All air for combustion is primary and is brought

Turn to Page 154

photograph by d'Arazien

Our "*hidden service*" makes steel more useful to you

HOW do you discover the hidden qualities of a material as hard and dense as steel? Difficult as it may sound, there are ways you can ferret them out when you have a special service like Jones & Laughlin's Quality Control.

Some of our Quality Control methods are almost routine—chemical analyses, micrographs, fracture tests, Brinell hardness tests, tensile tests, impact tests. Others involve techniques and machinery that are intricate—having been designed for special purposes.

For example, this high-pressure hydrostatic tester is a precisely-engineered mechanism. It tests with water pressures up to 10,000 lbs. per sq. inch and will indicate in a few moments whether J & L oil country seamless steel casing or tubing will withstand the terrific pressures encountered in a deep oil well.

Our Quality Control technicians have many other valuable facilities at their command. That is your insurance that the steel behind the J&L trademark is of uniform quality and dependability.

DEFENCE MORE STEEL TODAY... MORE STEEL TOMORROW

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH 30, PA.

New *Flexible Sealing...*

T-J AIR CYLINDER

Designed with revolutionary application of

Super-Cushion

It's *sealed with pressure*—a revolutionary T-J application of flexible sealing that insures positive cushion action combined with automatic valving action for fast return stroke . . . eliminates binding and sticking . . . operates with *low friction, minimum wear,* and *added power* due to higher efficiency.

More PLUS features! New type packing nut incorporates a piloted diameter, assuring perfect alignment. Improved rod packing increases sealing efficiency. Piston rod and internal cylinder tube surfaces are hard chrome plated—a standard practice with T-J for over 15 years.

Write for bulletin 252.
The Tomkins-Johnson Co.
Jackson, Mich.

1. Metallic rod scraper to protect rod bearing and packing from dirt and grit.
2. Wrench flats.
3. Self-adjusting chevron type packing.
4. Permanent type adaptor ring.
5. Hi-tensile tie rods.
6. Heavy duty, hard chrome plated rod.
7. Generous fillet reduces stress concentration.
8. "O" ring static seal.
9. T-J new flexible cushion seal insures positive cushion with automatic valve action for fast return stroke. (Patent applied for)
10. Fine cushion adjustment.
11. Heavy wall precision honed hard chrome plate.
12. Controlled packing compression with metal to metal contact.

36 YEARS' EXPERIENCE (T-J)

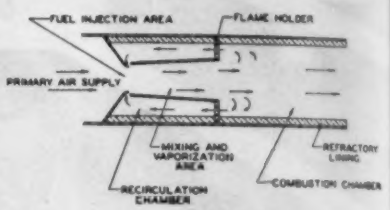
TOMKINS-JOHNSON

RIVETORS AIR AND HYDRAULIC CYLINDERS CUTTERS CLINCHORS

into the burner in a conventional manner. Oil is injected through a standard pressure atomizing oil nozzle.

Oil and Air—Oil is premixed with the combustion air and vaporized within the burner itself without external vaporizing equipment.

As shown in the drawing a portion of the products of combustion are recirculated within the burner



COMBUSTION PRODUCTS are recirculated within the burner by venturi-diffuser.

by a venturi-diffuser action and transfers sufficient heat to cause the oil spray to be changed to a vapor. Combustion of the resulting gas takes place in the refractory lined combustion chamber.

Heat at rates of from 1,000,000 to over 10,000,000 btu's per hr per cu ft of combustion volume is released, depending on the output.

Stainless Shell — A tubular stainless steel outer shell is provided where the burner is firing into a low temperature zone, for example, into a dryer. If the burner is to fire into a furnace, this shell is replaced with a refractory tile block which may be mounted directly into the furnace wall. The size and shape of this block can be suited to individual requirements on special order.

Lighting Specifications Published

A completely-revised edition of the *RLM Standard Specification* book has been published by the RLM Standards Institute, 326 W. Madison St., Chicago 6. Additions and revisions featured include: Two officially-approved new specifications; important revisions and clarifications of existing specifications; new tables of typical coefficients of utilization and light distribution curves.

Turn to Page 156

STANDARDS and SPECIALS by the Millions

THE FERRY CAP & SET SCREW CO.

2157 SCRANTON ROAD • • • CLEVELAND 13, OHIO

"SHINYHEADS"

America's Best Looking Cap Screw

Made of high carbon steel — AISI C-1038 — to standards for Full Finished hexagon head cap screws — bright finish. Heads machined top and bottom. Hexagon faces clean cut, smooth and true, mirror finish. Tensile strength 95,000-110,000 p.s.i. Carried in stock.

"HI-CARBS"

Heat Treated Black Satin Finish

Made of high carbon steel — AISI C-1038. Furnished with black satin finish due to double heat treatment. Hexagon heads die made, not machined. Points machine turned; flat and chamfered. Tensile strength 130,000-160,000 p.s.i. Carried in stock.

"LO-CARBS"

Made of AISI C-1018 steel — bright finish. For use where heat treatment is not required and where ordinary hexagon heads are satisfactory. Hexagon heads die made to size — not machined. Points machine turned. Tensile strength 75,000-95,000 p.s.i. Carried in stock.

SET SCREWS

Square head and headless — cup point. Case hardened. Expertly made by the pioneers in producing Cup Point Set Screws by the cold upset process. Cup points machine turned. Carried in stock.

FILLISTER CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

FLAT HEAD CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

"SHINYLAND" STUDS

All studs made steam-tight on tap end unless otherwise specified, with flat and chamfered machined point. Nut end, oval point. Land between threads shiny, bright, mirror finish. Carried in stock.

ADJUSTING SCREWS

Valve tappet adjusting screws — Hexagon head style — to blue print specifications — hexagon head hard; polished if specified — threads soft to close tolerance — points machine turned; flat and chamfered.

CONNECTING ROD BOLTS

Made of alloy steel — heat treated — threads rolled or cut — finished to extremely close thread and body tolerances — body ground where specified. Expertly made by the pioneers in producing connecting rod bolts by the cold upset process.

SPRING BOLTS

Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.

FERRY PATENTED ACORN NUTS

For ornamental purposes. Steel insert — steel covered. Finish: plain, zinc plated, cadmium plated. Size: 9/16", 3/4", 15/16" across the flats.

Tapped 1/4" to 3/4" inclusive. Cross section of Ferry patented acorn nut, showing how steel hexagon nut fits snugly into shell.

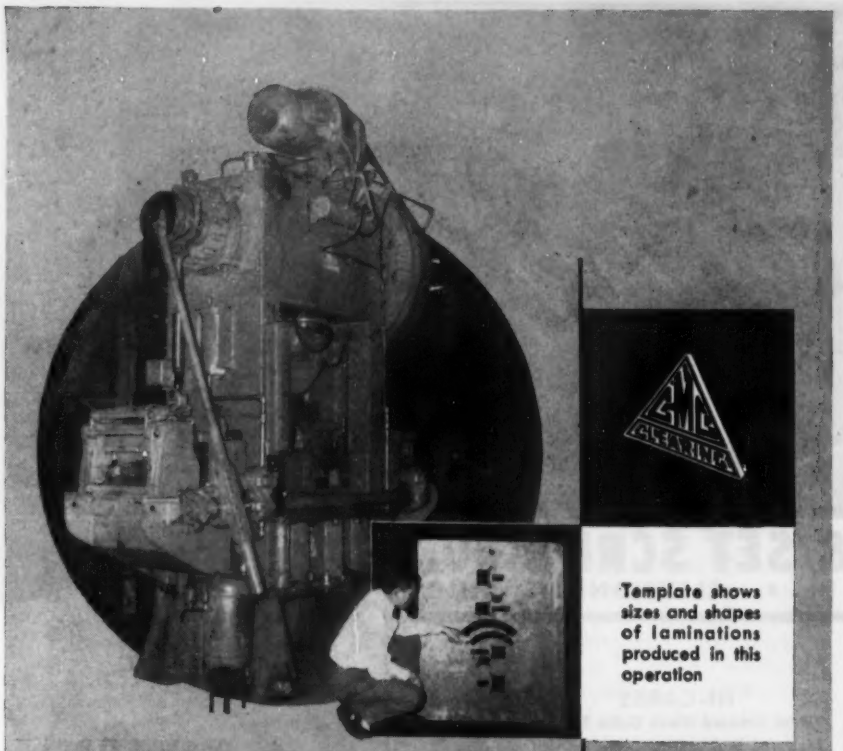
Pioneers and Recognized Specialists, Cold Upset Screw Products since 1907

STANDARDS carried by LEADING DISTRIBUTORS

* **SPECIALS** furnished to BLUE PRINT SPECIFICATIONS

WRITE FOR INFORMATION

SEND FOR SAMPLES



Template shows sizes and shapes of laminations produced in this operation

LOGICAL CHOICE

This Clearing press in the new multi-million dollar "dream plant" of Lincoln Electric Company at Cleveland is producing laminations at 150 strokes per minute, with automatic feed and scrap cutting. Perhaps no manufacturer is better known than Lincoln Electric for its unremitting attention to costs, coupled with a famed incentive system that gives its workers an average yearly wage exceeding $7,000. Only the most efficient equipment can win a place in such a plant. It's no coincidence that Clearing presses are commonly found in plants that are setting new standards for industry. Clearing presses have been setting new standards on their own—new conceptions of speed, of accuracy, of die life. It will pay you to check with Clearing engineers for a forward-looking answer to your press problems.

CLEARING MACHINE CORPORATION
6499 WEST 65TH STREET ★ CHICAGO 38, ILLINOIS
HAMILTON DIVISION, HAMILTON, OHIO

CLEARING PRESSES
THE WAY TO EFFICIENT MASS PRODUCTION

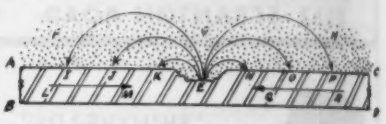
—Technical Briefs—

Corrosion:

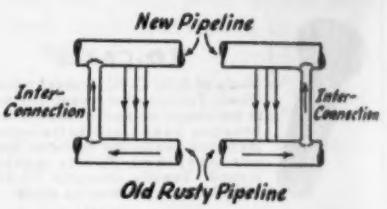
Electro-chemical theory explains breakdown of metals in use.

A primer on corrosion and its prevention, recently prepared by Koppers Co., Inc., gives a brief, clear outline on what happens to a metal exposed to corrosive conditions.

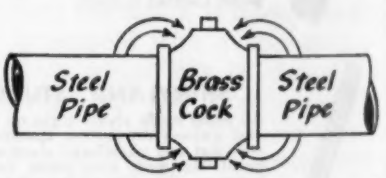
A series of drawings illustrates what takes place when metals are connected by an electrolyte such as water and dissolved chemicals. An electrical potential—different for each metal—develops.



STRUCTURAL STEEL member, in section, is shown under ground. Steel ABCD is surrounded by electrolyte FGH. Current flows from corroding section E through electrolyte FGH to points I-J-K-N-O-P, and along L-M and R-Q. Metallic iron from E combines with chemicals in electrolyte.



NEW UNCOATED pipeline installed near old underground line often corrodes faster than old pipe because of electrolytic action. Galvanic cell is set up by two pipes. New pipe corrodes where current leaves it.



DISSIMILAR METAL such as brass cock connected between two steel pipes also sets up galvanic cell which is important part in the corrosion process.

Galvanic Cell—When the metals are connected with a conductor an electro-chemical cell forms and electric current flows from the higher potential metal through the electrolyte to the metal of lower potential. This is known as a galvanic cell.

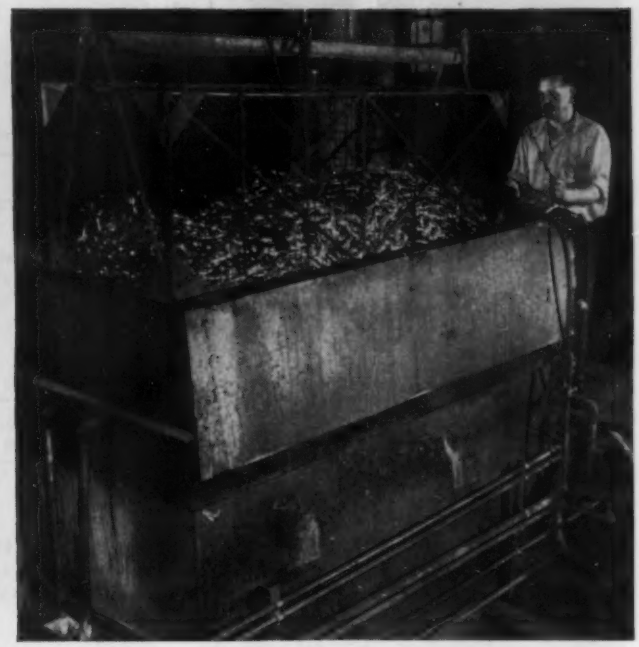
Where a single piece of metal is in contact with a non-homogeneous electrolyte, there will be a flow of

Turn to Page 158

VAPOR DEGREASING *with* "TRICLENE" D
(TRICHLORETHYLENE)

cleans appliance parts in less than a minute!

STOVE BURNER PARTS are thoroughly cleaned at an average rate of 3000 parts/hr. Vapor degreasing with "Triclene" D quickly removes cutting oils, chips and drawing compounds . . . leaves no spots . . . requires no afterdrying.



REFRIGERATOR PARTS are prepared for assembly by vapor degreasing with "Triclene"D. Dust, dirt and oil are removed in one fast step. Equipment is simple to operate, easy to maintain and efficiently re-uses solvent for maximum economy.

FAST, SURE METAL CLEANING at the lowest possible cost is assured by vapor degreasing with Du Pont "Triclene" D Trichlorethylene. Intricate parts of all sizes, shapes and metals are cleaned with the same ease as smooth sections, and can be handled in the same equipment. And wherever speed is essential, "Triclene" D meets top production demands . . . removes the heaviest oils and grease in a matter of seconds. Parts emerge thoroughly clean, warm and dry after vapor degreasing—instantly ready for further processing or assembly.

***"TRICLENE" D** is designed for vapor degreasing by the pioneers of the Trichlorethylene field. In wide use for many years, "Triclene" D is fully backed by Du Pont research plus the practical experience of Du Pont technical representatives.*

OUTSTANDING PROPERTIES OF "TRICLENE" D

- Stable
- High Purity
- Rated nonflammable
- Withstands moisture and heat
- Narrow boiling range

DU PONT
first in solvents for
VAPOR DEGREASING

DU PONT
REG. U. S. PAT. OFF.

150th Anniversary

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

MAIL THIS COUPON NOW!

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Dept., Wilmington 98, Delaware

Please send me detailed information on Vapor Degreasing: applications, advantages, equipment used . . . and more facts on Du Pont "Triclene" D. We are interested in cleaning _____ products.

*Name*_____ *Position*_____

*Firm*_____

*Street & No.*_____

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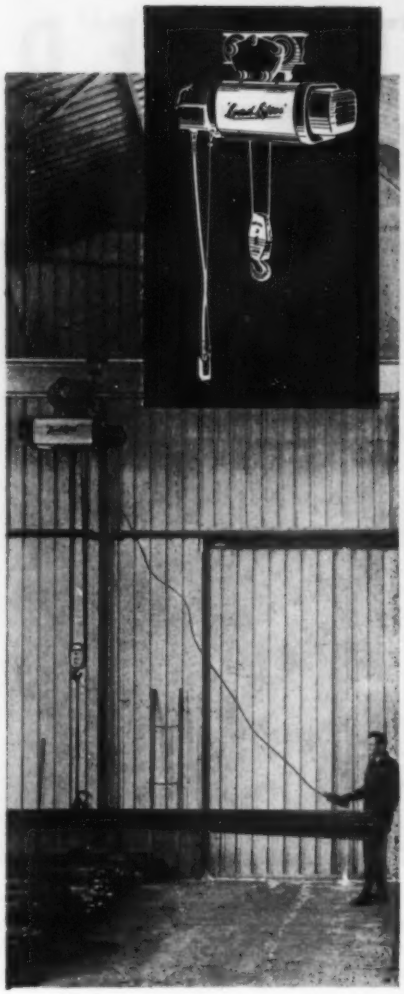


SHORT CUT TO MORE PRODUCTION

The "Series 700" 'Load Lifter' is the electric hoist for the job. It's fast — lifts a ton 30 feet a minute. It's easy to use. Push-button control eliminates muscle strain; the operator stays fit.

The 'Load Lifter' is tough, safe — has steel suspension; safety-type lower block and hook; motor and load brakes that require no attention; heat-treated helical gears; only 24 volts at the push button. Give *your* production a lift — at lower cost. Capacities: ½ ton and up. Write for 'Load Lifter' Bulletin 399.

MAXWELL MANNING MOORE MM&M TRADE MARK

'Load Lifter' ®

ELECTRIC HOISTS

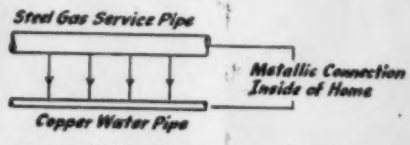
MANNING, MAXWELL & MOORE, INC.
MUSKEGON, MICHIGAN

Builders of "Shaw-Box" Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of 'Ashcroft' Gauges, 'Hancock' Valves, 'Consolidated' Safety and Relief Valves, and 'American' Industrial Instruments.

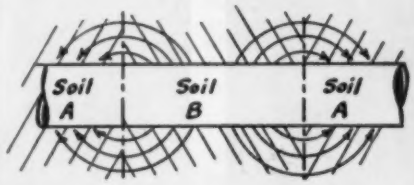
—Technical Briefs—

electric current when different areas are connected with a conductor. This is the concentration cell.

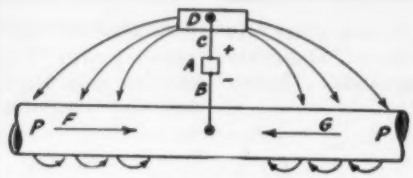
A third type, the electrolytic cell, occurs when an outside source of electric current is introduced into the circuit.



CORROSION of steel gas service pipe near copper water pipe may take place where systems connect inside building.



CHEMICAL CONCENTRATION in soil B, such as clay, causes current to flow through soil A. Arrows indicate current movement.



GROUND BED ANODE of old scrap steel pipe or discarded castings, D, protect buried pipeline P. Terminals of rectifier A are connected to groundbed. This establishes electro-chemical cell with current flowing through soil to pipeline.

Protective Coatings—There are several ways to stop the electrochemical action that causes corrosion. One is to apply a protective coating to seal the surface against direct contact with any electrolyte.

Another method is to apply a counter electro-motive force of slightly higher voltage from an outside source to the surface to prevent the action from getting started.

A third method is the combination protective coating and cathodic protection. For above ground installations the protective coating method, with coatings such as the bitumastic enamels, or other modern anti-corrosive coatings, is believed the only practical protective system.

Turn to Page 161

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866
THE WHELAND COMPANY
CHATTANOOGA 2, TENN.

2

Like to spend more time reading and less hunting? Turn to page 2 of your Iron Age EVERY week and let the contents page help you find your favorite features.

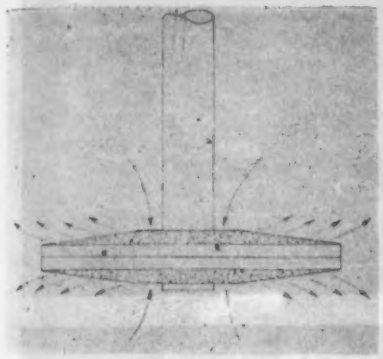
IT PAYS TO READ IRON AGE ADS TOO!

—Technical Briefs—

Use Stainless for Mixer, Filter

A unique application for stainless steel has been made in a new type mixer and batch filter and liquid and gas disperser. A porous stainless steel cell unit mounted on a rotary shaft which spins at high velocity makes up the device.

Called the Poro-Velocell, the 2⅞-in. OD unit is made in two halves. Each half has a saucer shaped stainless steel disk welded



STAINLESS STEEL is used for the porous disks and shaft of the unusual Poro-Velocell liquid and gas mixer and batch filter. Arrows indicate movement of liquids or gases into orifices concentric with shaft and out through porous disk.

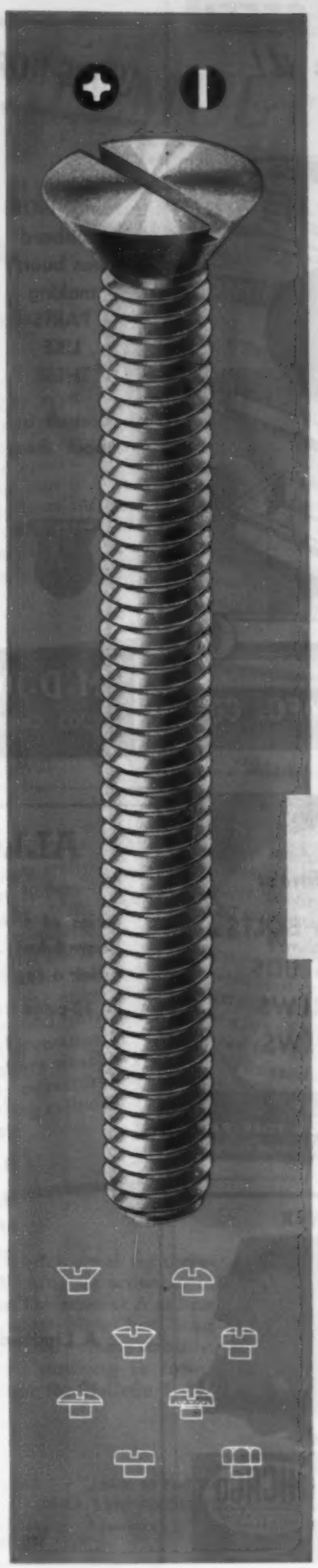
to a 3-spoke wheel design stainless steel mounting plate. The disks have a large orifice in the center.

Liquid enters through the large orifices, one above and one below, which are concentric with the shaft. Liquid is thrown out of the cell through the porous metal walls by centrifugal action.

The flow of the liquid through the metal walls assures maximum shearing action and best dispersion. Liquid is filtered simultaneously with the mixing action.

"They say his wife is a heavy spender."

Turn to Page 166



Whatever type of machine screw you need, Blake & Johnson has it... or can make it for you. Slotted or Phillips heads — in brass and steel, plain or plated. Special designs, sizes, and finishes to order. Blake & Johnson is the dependable source for Twin-Fast® wood screws, stove bolts, tapping screws, special headed products, machine screw nuts, rivets, chaplets, wire forms, automatic screw machine products... in steel, brass, or other alloy metals.

Write for new catalog ▶

TAPPING SCREW

TWIN-FAST SCREW

fastenings

BLAKE & JOHNSON

SINCE 1849

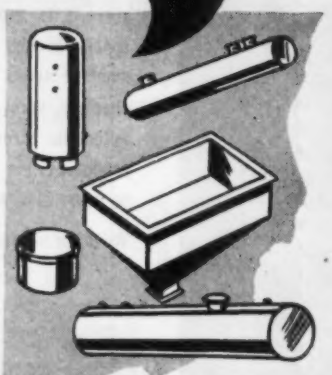
WATERVILLE 48, CONNECTICUT

If it's made of **PLATE STEEL**

Stover can make it!

*THE WIFE-MOBILE
YOUR WIFE'S OWN
TOWN CAR

OTHER EXAMPLES OF STOVER FABRICATION



You can bring your steel fabrication to Stover with complete confidence. The Stover technicians are capable of constructing any article made from plate steel, to the most exacting specifications. Stover engineers will gladly go over your plans with you and help set them into production.

STOVER STEEL TANK & MFG. CO.
FREEPORT, ILLINOIS

WIRE FORMS

Since 1905 Hubbard has been making PARTS LIKE THESE

Consult us about them

M. D. Hubbard Spring Company
303 Central Avenue • Pontiac 12, Mich.

LOOK TO WHO*

For the finest
COUPLING BOLTS
MILLED STUDS
CAP SCREWS
SET SCREWS

*WHO is... Wm. H. Ottemiller Co., YORK, PA.
Write for name of nearest distributor and our free illustrated folder.

STEEL HAND AND POWER
CHICAGO **BENDING BRAKES**

For Single and Quantity Runs Bending Steel Plate and Sheet Metal

Special Bending Brakes
Double Folder Brakes

DREIS & KRUMP MANUFACTURING COMPANY
CHICAGO
7430 S. Loomis Blvd., Chicago 36, Illinois

ALLOY TROUBLE?

If you have missed the special Iron Age series of five articles on boron steel which appeared last July and August you may want to order a reprint.

A 30-page reprint booklet covers the following:

1. *Boron steel alternates for standard grades.*
2. *Advantages and limitations of boron steels.*
3. *Hardenability charts.*
4. *Case studies of boron steel use in plants making gears . . . pinions . . . springs . . . bolts . . . axles.*

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How B&W ALLMUL cuts severe service refractory costs

LEAD DROSS FURNACE

"ALLMUL proves more economical than any refractory tried!"

A plant with several reverberatory type smelting furnaces, used to melt alloys of lead, tin and antimony, carried on an extensive investigation to obtain economical refractory linings. Practically every type of refractory was tried. Side-by-side tests in the same furnace proved the economy of B&W Allmul over all others. Result? Allmul is now standard for these furnaces.

CONTINUOUS WELD PIPE FURNACE

"Three times the life in worst wear areas!"

A large manufacturer was troubled by the short life of kyanite-base refractories in certain areas of his furnace. Then B&W Allmul were installed in the uptake arches, a critical, severe-service area. Result? Allmul lasted three times as long as previously used refractories and has been ordered for general use in all areas of this manufacturer's furnaces of this type.

INDIRECT ARC FURNACE

"All furnaces converted to ALLMUL after comparative tests"

A large company making alloy steel castings has several indirect arc furnaces melting various alloys, with pouring temperatures varying from 2700F to 3100F. With highest temperature alloys, semi-mullite brick burned out in 6 to 10 heats. B&W Allmul, which cost approximately the same, showed no appreciable wear after 20 heats. On alloy steels in general, this customer reports far-less slag formation (an indication of reduced refractory wear) with Allmul than with any other refractory used. Result: All furnaces are being relined with B&W Allmul Firebrick.

ELECTRIC FURNACE ROOF

"ALLMUL lasts 3 to 6 times as long"

In a six-ton electric furnace, handling 15 tons of stainless steel per charge, super duty firebrick had to be replaced every 20 to 40 heats. Pouring temperature of the metal was in excess of 3100F, with higher temperatures attained in the furnace during periods of oxygen introduction. The owner installed B&W Allmul Firebrick, hoping for a life of 80 heats. Allmul in the first roof lasted for 122 heats—42 more than hoped for. The second roof of Allmul went to 131 heats! Result? Further orders for Allmul.

Yes, the facts about B&W Allmul Firebrick speak for themselves. This fused-mullite brick is proving its economy in dozens of severe service applications. The reason? A unique combination of refractory properties—high hot load strength, high resistance to spalling, good volume stability, a high melting point of 3335F—all resulting in lower furnace costs. Want more data? Write for Bulletin R-29.

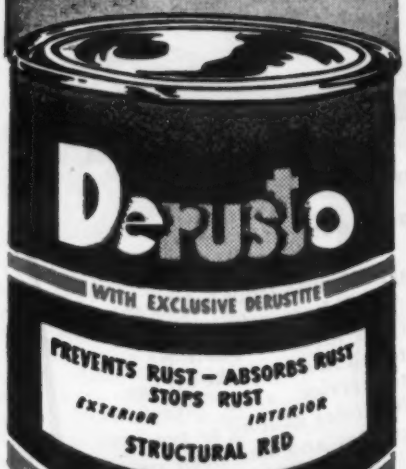
BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 85 LIBERTY ST., NEW YORK 6, N.Y.
WORKS: AUGUSTA, GA.

R-445

B&W REFRACTORIES PRODUCTS—B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick B&W Refractory Castables, Plastics and Mortars • OTHER B&W PRODUCTS—Stationary & Marine Boilers and Component Equipment . . . Chemical Recovery Units . . . Seamless & Welded Tubes . . . Pulverizers . . . Fuel Burning Equipment . . . Pressure Vessels . . . Alloy Castings

For MAXIMUM PROTECTION on all METAL SURFACES...



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PREVENTS RUST

STOPS RUST

DERUSTO has successfully passed all tests given by the Pittsburgh Testing Laboratory.

DERUSTO comes in standard industrial colors . . . ready for spraying, brushing, or dipping.

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MASTER BRONZE POWDER COMPANY
5009 CALUMET AVE.
HAMMOND, INDIANA

—Technical Briefs—

Shell Molding:

New plastic products may help meet foundry problems.

Four new plastic products for the foundry industry and expansion of research and production facilities to meet growing demand for phenolic resins were announced this week by Monsanto Chemical Co.

Production of resins for the shell mold process are expected to increase 100 pct this year, Monsanto officials have estimated.

Faster Cycles — Two phenolic resins described as fast curing and fast coating compounds were developed to obtain faster cycles in casting operations.

A urea core binder, Resimene 970, combines improved baking rates with high bonding efficiency and freedom from odors. It is a free-flowing dry powder, essentially free from ash and skin irritants.

No Catalyst — No catalyst is necessary when the urea core binder is used, and little, if any, increase in cereal is required to hold the same level of green strength.

To meet the problem of dust in the foundry, a non-toxic, mobile fluid of medium viscosity, Dust Suppressant A, has been developed. Monsanto claims the suppressant will hold down dust without changing significant characteristics of the shell mold resin-sand mix.

"Quicksand!!"

Need HEAVY industrial GEARS in a hurry?

Call SIMONDS First!

A call to SIMONDS gives you the benefit of more than 60 years of specialization . . . assures fast, accurate reproduction of the most exacting specifications . . . and SIMONDS' central location cuts delivery time to a minimum. For all types of heavy industrial gears, up to 145" dia. and including cast or forged steel, gray iron, bronze, Meehanite, rawhide and bakelite—SIMONDS' production is geared to serve you promptly.

Stock carrying distributors for Ramsey Silent Chain Drives and Couplings, Industrial V-Belts.

SIMONDS GEARS

THE SIMONDS GEAR & MFG. CO.
LIBERTY at 25TH PITTSBURGH 22, PA

All Sides Feel Pressure for Quick Settlement

Government seizure so far a failure . . . Administration needs settlement to pull its chestnuts out . . . Negotiators aren't too far apart on dollars and cents . . . Steel stocks large.

Pressure for settlement of the steel wage price case is growing. The Administration, which has been trying to force pistol-point bargaining on the industry, is now feeling the pressure too. Government seizure of steel companies has so far turned out to be a dud.

Here are the reasons: (1) It has not kept the industry operating. (2) It has been ruled illegal since it "lacks basis in law." (3) It settled nothing. (4) On-again-off-again operations have thrown another huge cost bill onto the industry.

Could Be—Now that the pressure for settlement is also being felt by the Administration, the outlook for early agreement is brighter than it has been for several weeks. For one thing Mr. Truman may decide that it is extremely important to achieve a settlement before the Supreme Court reviews Judge Pine's ruling against seizure. Here are some possible courses which could lead to settlement:

(1) Mr. Truman might decide to give the steel companies enough price increase (possibly $5 to $6 per ton) to cover the bulk of the direct cost of the wage package. This he must do sooner or later anyway. He did it in 1946.

(2) Mr. Truman might try to get Phil Murray to shade his adamant stand on Wage Stabilization Board recommendations and take less—which would mean steel firms would also take less in prices. In this way Mr. Truman could save face by saying that stabilization was being held.

(3) Mr. Truman might take over negotiations personally—as he has not done—and settle the issues. This course would probably call for some giving on all sides. It could result in a schism between him and Mr. Murray.

Union Shop—For one thing, the steel companies will not accept the union shop. So far Mr. Murray has not budged—on any point—from WSB recommendations. Industry considers this issue to be fully as important as wages and prices.

In actual dollars and cents the negotiators are not so far apart as to make settlement hopeless. The best industry offer so far has been a 20¢-per-hr. package, including a 12½¢ wage increase. WSB recommendations were for 26¢ (or 30¢ by industry figures). On prices, the government once offered $4.50 per ton. This was later withdrawn. Another dollar might have settled the case then. Major deterrent to quick settlement is the bitterness which has risen since the Administration intervened.

All Losers—If an agreement is not reached before the Supreme Court ruling, all parties might lose. Should the Supreme Court uphold Judge Pine's decision and return steel companies to their owners, it would be a bitter defeat for the Administration. Mr. Murray would probably call another strike. The final give and take might be long and bitter, and might rock the industry.

Inventories of steel users are so comfortable now that they might spell trouble during the second half of the year. Throughout the steel crisis there has been practically no panic on the part of consumers. Many of them have seemed almost blase.

Consumers Report—An industry-wide check by THE IRON AGE shows that steel inventories of most consumers still range from 30 to 60 days. Consumers who use fewer different types of steel products are generally better off. Subcontractors and parts vendors are generally in less favorable inventory position.

Here are some examples: A manufacturer of materials handling equipment reports its position is "golden." It has an inventory of at least 60 days on all steel products it uses, including alloy bars and light alloy plate. In a pinch this firm could stretch its stock for 3 months. Its inventories became top heavy at the first of the year and it has been leveling them off ever since.

Scraping the Barrel—A stamping plant using cold-rolled coils says its present supply will last 30 to 45 days by scraping the barrel. It will shear and slit to get needed sizes.

A manufacturer of industrial fasteners, which uses wire and rods, reports its inventories will last for 4 to 6 weeks. Another manufacturer says it can hold out for at least a month. A maker of electric lift trucks says inventories will carry them for 45 to 60 days without much difficulty except for 2-in. plates.

Steelmaking operations this week are scheduled at 81 pct of rated capacity, an increase of 32 points from last week's revised rate. Output is expected to reach about 95 pct of capacity by Wednesday. After that it will climb slowly.

If you want STEEL tomorrow

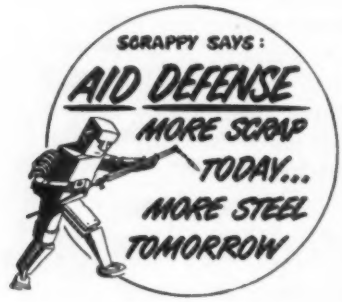
SELL YOUR SCRAP TODAY!

Iron and steel scrap is needed now to meet both defense and domestic demands for new steel. You can help America—and yourself—by organizing a plant-wide scrap drive today.

America's steel mills are presently producing in excess of 100 million ingot tons annually, *but* the scrap on hand is nowhere near sufficient to maintain this vitally needed volume.

Your cooperation in helping to build up the supply of scrap is earnestly requested.

Comb your plant and yards for dormant iron and steel; collect it, and call in your local scrap dealer. Do it now! Every pound of scrap collected will help secure the future.



WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

Market Briefs

Wrong Party—Shortage-investigating Congressmen last Sunday continued a bewildered attack on International Materials Conference. Eight of a large group denounced IMC as causing unemployment in the U. S. by shortchanging the U. S. on imports of foreign copper. Truth of the matter is that manufacturers here have not been able to import what they needed because of Office of Price Stabilization price controls. The U. S. ceiling is much below the world market price and any intended purchases stop right there. The U. S. has not been able to import anything near its IMC ration. The situation was explained fully in an IRON AGE article, Mar. 27, 1952. Wasn't Congress reading?

Getting Tough—Commerce Dept. is tightening up its guard to prevent shipment of strategic materials into forbidden countries. Beginning May 1, applications to export strategic materials to stated nations must be accompanied by certificates witnessed by the foreign customer's government as assurance against transshipment to unapproved destinations. Affected commodities are those on the positive list identified by the letter A. Countries affected are United Kingdom, Belgium, France, Denmark, Italy, Luxembourg, Norway, Portugal, Holland and Western Germany.

March Sales—Adjusted wholesalers' sales for March are estimated at $8049 million, reports Office of Business Economics, Dept. of Commerce. After adjustment for seasonal variations, this figure represents an 8 pct drop from February. Declines were general in durable goods, with greater than 10 pct losses appearing in construction materials, electrical goods, hardware and jewelry. Machinery and metals maintained February sales pace. Inventories of all wholesalers remained static.

Foundry Boost—Relaxation of government controls on construction may bring some relief to suffering foundries in the Southwest which turn out soil pipe for this market. First sign of improved conditions will be a firmer cast scrap market. Foundries in the area were hard hit by the controls and Birmingham was one of the first cast scrap markets to go below ceiling prices.

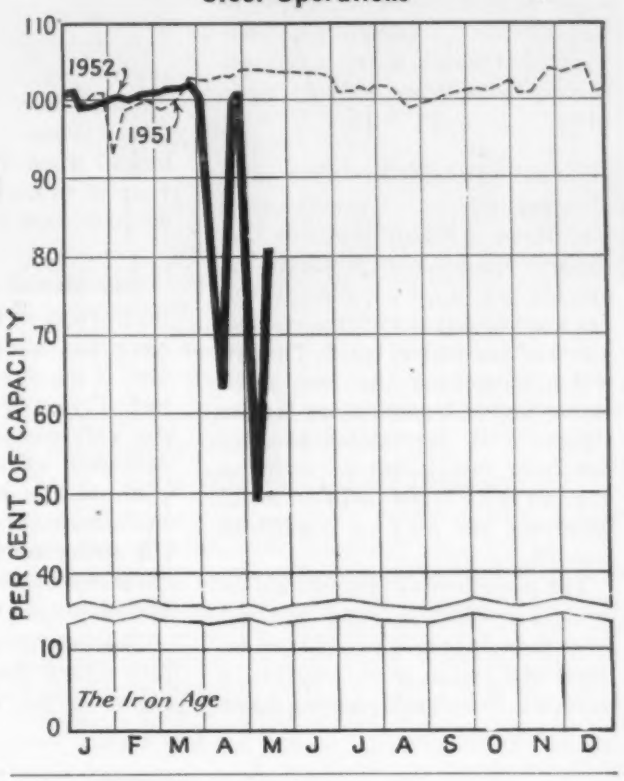
Soviet Steel—Russian steel output for 1951 has been estimated at 31 million tons by Economic Commission for Europe. ECE adds that Soviet steel production and consumption have increased rapidly in recent years. A target of 60 million tons by 1960 has been authoritatively mentioned.

Defense Needs—Military and atomic programs will call for one-fifth of steel output, one-third of available copper, and two-fifths of available aluminum during the next year, Washington predicts. Defense Production Administration made these estimates public this week in asking Congress for extension of authority to stockpile scarce materials. Total U. S. stockpile is now only one-third complete.

Aluminum Expansion—Production of secondary aluminum ingots began May 1, at Colonial Aluminum Smelting Corp.'s new smelter at Columbia, Pa. Sales and purchasing for the new company are being handled by Colonial Metals Co., Columbia, Pa.

Competition—Competitive conditions in the steel market which may force price cutting as described last week (THE IRON AGE, May 1, 1952, p. 92) were meant to apply to integrated mills rather than non-integrated producers.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
Apr. 27	44.5*	50.0*	43.0*	55.0*	64.0*	44.5*	28.0*	44.0*	66.0*	46.0*	56.0*	50.0*	36.5*	49.0*
May 4	75.0	87.0	73.0	80.0	88.0	74.0	95.5	78.0	101.0	72.0	89.0	78.0	70.0	81.

Beginning Jan. 1, 1952, operations are based on annual capacity of 109,587,670 net tons.
* Revised.

Lead Price Reduced 2c in Week

First 1¢-cut didn't stimulate buying . . . Sellers to hold at 17¢-level to test market . . . Will probably reimpose tariff . . . Chile cuts U. S. copper contract—*By R. L. Hatschek.*

When the lead market failed to show more zip following the price reduction of 1¢ per lb to 18¢ at New York the price was further reduced by the same amount to 17¢ per lb. This second action had been expected by buyers and it was the reason for their abstinence after the first cut—they wanted to see where the market would stabilize.

Principal sellers of the metal now intend to maintain the present 17¢-level, at least for a while, in order to feel out the market at this price. There was no immediate surge in business but that may be only temporary. Certain lead compounds, as well as scrap metal containing lead, also drifted off in price.

Return Tariff—The new price plus general market conditions in lead make it highly probable that the average price will remain under 18¢ per lb for a sufficient time (at least 30 days) to force reimposition of the import tariff. The law which suspended the lead tariff states that it is mandatory for the President to reestablish the ¾¢ per lb of metal content tariff on ore and the 1 1/16¢ tariff on metal whenever the above conditions prevail.

The presidential move would be made sometime in June and not later than July 2. It would then require new action from Congress to suspend the tariff again. Laws suspending import duties on zinc and copper are similarly worded though zinc will probably not be reduced until later this year and it is extremely doubtful that the copper price will be cut at all this year if present world conditions continue (see p. 75).

Zinc Market—The reductions in lead prices of the past week could have had a depressing effect on zinc if the steel strike had continued. Prime Western grade, used for galvanizing, is short but an extended strike might have changed this, and other grades are in fair to very good supply. But the strike ended and with it, any great softness it would have created.

The new freight rates that went into effect May 2 caused an increase in the New York delivered price. Prime Western zinc is now quoted at 20.33¢ per lb instead of 20.29¢.

Copper From Stockpile — Last week Rep. James T. Patterson of Connecticut requested House support for his proposal that 30,000 tons of government stockpile copper be doled out over a 3-month period to private industry. Basis for his plea is unemployment in the copper fabricating industry due to shortage of the red metal. General feeling among copper people is that metal will be released by the government.

Meanwhile, the strike in Chile continues and the loss of copper mounts. At least 5000 tons of metal had been lost by the beginning of the week and nothing by way of progress toward a settlement had been reported. The Garfield Smelter strike was quickly settled and production there has already been resumed. Production losses from the Chilean strike may well mean even sharper curtailment of the metal's use unless the stockpile is tapped.

Breaks Contract—Latest word at press time is that Chile has abrogated the agreement whereby the U. S. receives 80 pct of that country's copper output at 27.5¢ per lb. Chile now intends to sell its total production on the open world market at an undisclosed price. Current world price is about 38¢ per lb and Chile has been trying to get 6¢ more from the U. S in order to offset lower income from other sales.

At the higher price Chile would sell all its copper here. This latest move is an obvious threat to this nation's production efforts designed to force the acceptance of the 33.5¢ price. Defense Production Administrator Manly Fleischmann has termed the situation very serious. He's right. Reports also indicate that the Chileans intend to nationalize the industry, a short-sighted move, according to one Anaconda official.

MONTHLY AVERAGE PRICES

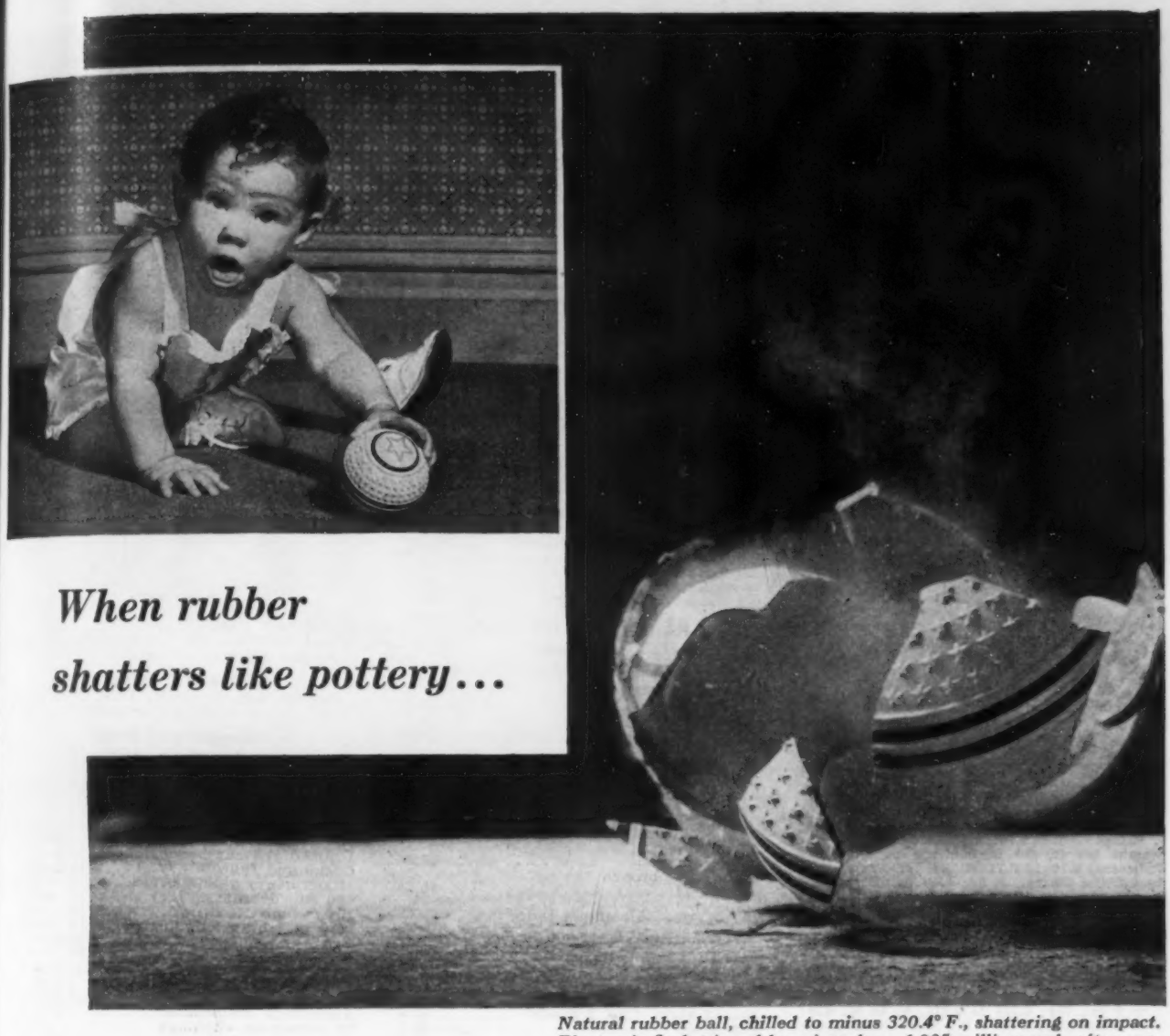
The average prices of the major nonferrous metals in April based on quotations appearing in THE IRON AGE, were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley	24.50
Lake copper, delivered	24.625
Straits tin, New York	$1.215
Zinc, East St. Louis	19.50
Zinc, New York	20.29
Lead, St. Louis	18.71
Lead, New York	18.91

NONFERROUS METAL PRICES

	Apr. 30	May 1	May 2	May 3	May 5	May 6
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.215	$1.215	$1.215	....	$1.215	$1.215
Zinc, East St. Louis	19.50	19.50	19.50	19.50	19.50	19.50
Lead, St. Louis	17.80	17.80	16.80	16.80	16.80	16.80

Note: Quotations are going prices.



When rubber shatters like pottery...

Natural rubber ball, chilled to minus 320.4° F., shattering on impact. Electronic flash tripped by microphone 1.035 milli-seconds after contact. Photos by Ralph Bartholomew, Jr.

Natural rubber *will* shatter, up in sub-stratosphere planes, at minus 50°F. Don't shiver; that's *warm* compared to temperatures some chemical equipment must take in stride.

Put yourself in the shoes of the man who designs an oxygen vaporizer. It must test 4200 pounds per square inch at minus 300°F.!

Or a helium liquefier that operates within 4 degrees of *Absolute Zero,* (which is exactly 459.6° below zero Fahrenheit).

Now that's cold. At temperatures like that, an orange spalls off in little chips, like granite. Steel brittles like a bit of glass.

In such a fantastic Jules Verneland, you discover that one metal and its alloys keep their toughness—ductility—clear down to 455° below zero F. Even the *"impact properties of weldments are essentially insensitive to temperatures as low as minus 320.4°F."*

So let's assume your problem is on the cool side, starting at 100° below zero and dropping off from that. You find the answer—as did the designers of the oxygen vaporizer and the helium liquefier mentioned above—in Nickel or a nickel alloy. (These two jobs were solved by Monel, an Inco Nickel Alloy.)

Let's Talk about Your Problem

Is it complicated too by sub-zero cold—or high heat, or corrosion, or some other difficulty?

Now is the time for us to get together with you or your engineers while our staff of metal specialists can carry out whatever research is needed to solve it. You can mail the outline of your problem direct to them for study by addressing it to The International Nickel Company, Inco Nickel Alloys Dept., 67 Wall Street, New York 5, N. Y.

Then the answer can be ready at your hand when these critical times are over, and Inco Nickel Alloys are available in any quantity for any use again.

THE INTERNATIONAL NICKEL COMPANY, INC.

INCO TRADE MARK **Nickel Alloys**

Monel® • "R"® Monel • "K"® Monel • "KR"® Monel • "S"® Monel Nickel • Low Carbon Nickel • Duranickel® Inconel® • Inconel "X"® • Incoloy® • Nimonics

Nonferrous Prices

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb; f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 33.5¢; 52S, 35.6¢; 24S-O, 24S-OAL, 34.1¢; 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 32.9¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.

Plate ¼ in. and heavier: 2S, 3S-F, 28.3¢; 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.

Extruded Solid Shapes: shape factors 1 to 5, 36.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 26, 39.6¢ to $1.16; 36 to 38, 47.2¢ to $1.70.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢ to 33.5¢; cold finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5 to 35¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32 in., 53.5¢ to 42¢; ⅜ to 1½ in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 39.5¢ to 29¢; 52S, 48¢ to 35¢; 56S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 75S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 63S-ST-5, OD in in.: 1¼ to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., $1.42; 96 in., $1.522; 120 in., $1.902; 144 in., $2.284. Gage 0.24 x 28 in., 72 in., $1.379; 96 in., $1.839; 120 in., $2.299; 144 in., $2.759. **Coiled Sheet:** 0.019 in. x 28 in., 28.2¢ per lb; 0.024 in. x 28 in., 26.9¢ lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in., 63¢; 3/16 in., 65¢; ⅛ in., 67¢; B & S Gage 10, 68¢; 12, 72¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311 in., 74¢; ½ to ¾ in., 57.5¢; 1¼ to 1.749 in., 53¢; 2½ to 5 in., 48.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057; ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to 0.219, ⅝ to ¾, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	77	60½
Strip, cold-rolled	83	63½
Rods and bars	73	58½
Angles, hot-rolled	73	58½
Plates	75	59½
Seamless tubes	106	93½
Shot and blocks	..	53½

Copper, Brass, Bronze

(Freight prepair on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	41.68	....	41.28
Copper, h-r	....	37.53	....
Copper, drawn	....	38.78	....
Low brass	39.67	39.36	....
Yellow brass	38.28	37.97	....
Red brass	40.14	39.83	....
Naval brass	43.20	37.26	38.52
Leaded copper	....	41.58	....
Com'l bronze	41.13	40.82	....
Mang. bronze	46.92	40.81	42.37
Phos. bronze	61.07	61.32	....
Muntz metal	41.18	36.74	37.99
Ni silver, 10 pct	49.82	52.04	....

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	19.00
Aluminum pig	18.00
Antimony, American, Laredo, Tex.	44.00
Berryllium copper, 3.75-4.25% Be	$1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be	$69.50
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.55
Cobalt, 97-99% (per lb)	$2.40 to $2.47
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium dollars per troy oz.	$200
Lead, St. Louis	16.80
Lead, New York	17.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb.	24.50
Magnesium, sticks, 100 to 500 lb.	42.00 to 44.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$200 to $204
Nickel electro, f.o.b. N. Y. warehouse	59.58
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	52.75
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	88.00
Tin, New York	$1.215
Titanium, sponge	$5.00
Zinc, East St. Louis	19.50
Zinc, New York	20.33
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	27.25
No. 120	26.75
No. 123	26.25
80-10-10 ingot	
No. 305	33.00
No. 315	30.50
88-10-2 ingot	
No. 210	41.50
No. 215	40.00
No. 245	34.50
Yellow ingot	
No. 405	23.25
Manganese bronze	
No. 421	30.50

Aluminum Ingot

(Cents per lb, 10,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.6
0.60 copper, max.	20.4
Piston alloys (No. 122 type)	21.2
No. 12 alum. (No. 2 grade)	19.5
108 alloy	20.6
195 alloy	20.8
13 alloy	20.8
ASX-679	20.5

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	18.80
Grade 2—92-95%	18.60
Grade 3—90-92%	18.40
Grade 4—85-90%	18.20

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	37.84
Electrodeposited	33⅜
Flat rolled	38.34
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	26½
Ball anodes	25½
Nickel, 99 pct plus	
Cast	76.00
Rolled, depolarized	77.00
Cadmium	$2.80
Silver 999 fine, rolled, 100 oz lots, per troy oz., f.o.b. Bridgeport, Conn.	97½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	20½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz.	67¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ⅛¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21½	20¾
Yellow brass	19⅛	17⅞
Red brass	20½	19⅝
Comm. bronze	20½	19⅝
Mang. bronze	18½	17⅞
Brass rod ends	18⅞	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
Refinery brass	17.25*
Radiators	14.75

* Dry copper content.

Ingot Makers' Scrap

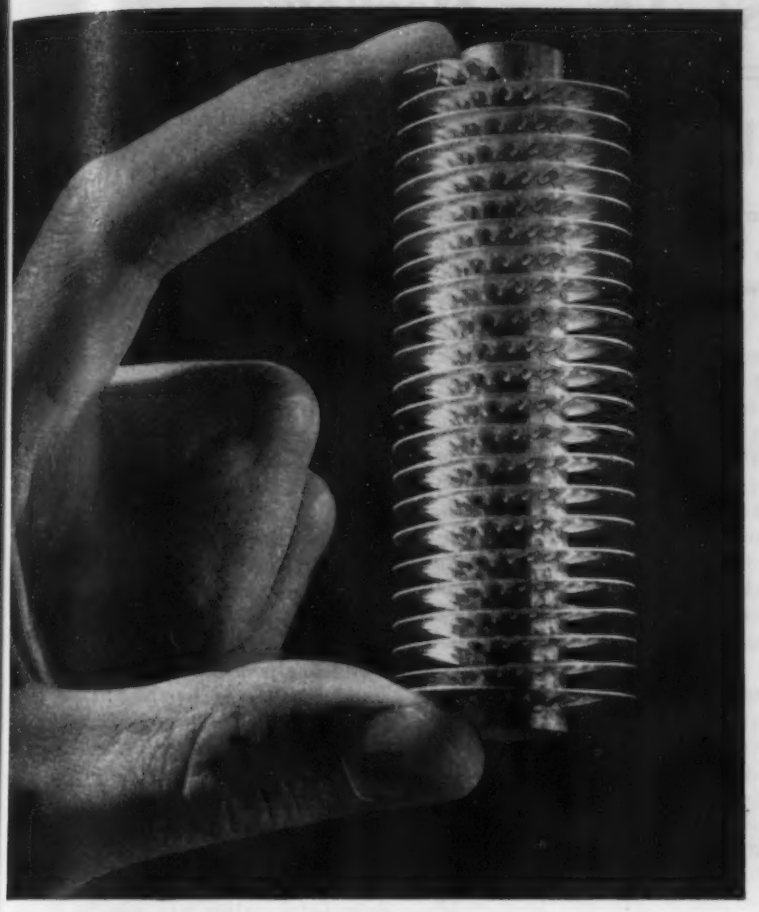
(Cents per pound, carload lots, delivered to refinery)

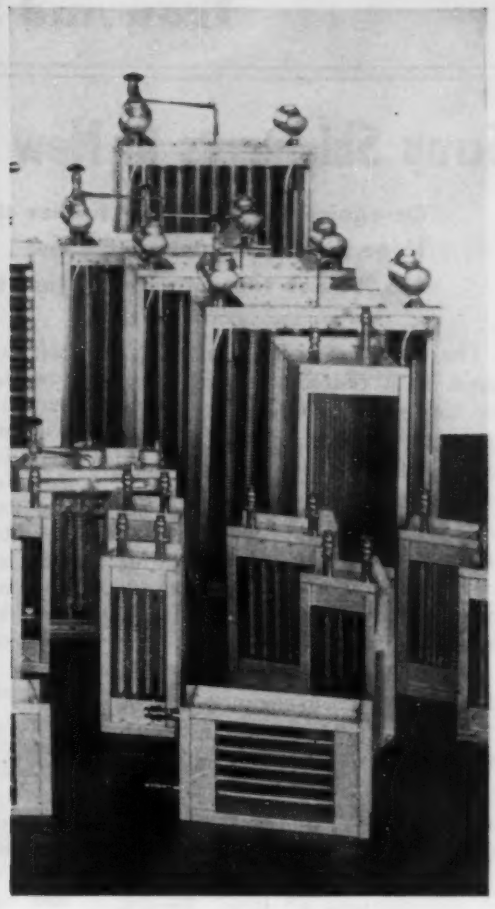
No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	18.50
No. 1 comp. turnings	18.25
Rolled brass	15.50
Brass pipe	16.50
Radiators	14.75
Aluminum	
Mixed old cast	9.75
Mixed new clips	11.00
Mixed turnings, dry	9.50
Pots and pans	9.25

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	18¾—19¼
No. 2 heavy copper and wire	17¾—17⅞
Light copper	16 —16½
New type shell cuttings	16 —16½
Auto radiators (unsweated)	14¼—14¾
No. 1 composition	18 —18½
No. 1 composition turnings	17¾—18
Unlined red car boxes	16¾—17¼
Cocks and faucets	15½—16
Mixed heavy yellow brass	12 —12½
Old rolled brass	15 —15½
Brass pipe	16 —16½
New soft brass clippings	16 —16½
Brass rod ends	15½—16
No. 1 brass rod turnings	15 —15½
Aluminum	
Alum. pistons and struts	6½— 7½
Aluminum crankcases	7½— 8
2S aluminum clippings	10½
Old sheet and utensils	7½— 8
Borings and turnings	5 — 6
Misc. cast aluminum	7½— 8
Dural clips (24S)	7½— 8
Zinc	
New Zinc clippings	13¼—13½
Old zinc	10 —10¼
Zinc routings	6¾— 7
Old die cast scrap	6¾— 7
Nickel and Monel	
Pure nickel clippings	35 —36
Clean nickel turnings	35 —36
Nickel anodes	35 —36
Nickel rod ends	35 —36
New Monel clippings	28 —29
Clean Monel turnings	20 —21
Old sheet Monel	28 —29
Nickel silver clippings, mixed	13 —14
Nickel silver turnings, mixed	12 —13
Lead	
Soft scrap, lead	13 —13¼
Battery plates (dry)	8 — 8½
Batteries, acid free	6
Magnesium	
Segregated solids	15 —16
Castings	14 —15
Miscellaneous	
Block tin	100 —110
No. 1 pewter	80
No. 1 auto babbitt	60
Mixed common babbitt	15½—15¾
Solder joints	21
Siphon tops	60
Small foundry type	20
Monotype	16½—17
Lino. and stereotype	15½—16
Electrotype	14 —14½
Hand picked type shells	14 —14½
Lino. and stereo. dross	7¼
Electro. dross	5¾— 6¼





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Durability of these stretched and compressed aluminum coils is demonstrated by the fact that they maintain a tight bond to the tube after more than eight years' service. Also contributing to this long life is aluminum's *high resistance to corrosion.*

Let a Kaiser Aluminum engineer help you determine if aluminum is the answer to your design or production problems. His services are available at no obligation or cost. 65 Kaiser Aluminum offices and warehouse distributors in principal cities. Kaiser Aluminum & Chemical Sales, Inc., Oakland 12, California.

Kaiser Aluminum

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Scrap Shipments in New Flip-Flop

On-again-off-again strike tactics slow or halt shipments . . . Hope that uncertainty will cease . . . Scrap trade loses about 625,000 net tons of sales in last two steel shutdowns.

The scrap market was once again in a fearsome gyration as the United Steelworkers of America shut down the steel industry for another short period. Their maneuver to wrest a high wage increase from the steel industry punched holes in the shipping schedules of scrap men. Most centers reported halted or slowed shipments.

The scrap trade hopes that Philip Murray's assurance that he could not strike against his ally, the Administration, means that shutdown uncertainty is at an end. It is now estimated that the two recent strikes have cost the steel industry and the country almost 2.5 million tons of steel. This is irretrievable because mills that have been operating at peak cannot speed up to catch the strike slack.

The steelmaking loss also means that the scrap trade in turn has lost irretrievably sales amounting to 625,000 net tons. Scrap men do not expect the shutdowns to have any substantial effect on demand and supply.

From the West Coast comes momentous news that No. 2 bundles sold for $5 a ton below OPS ceiling prices. Many scrap men are saying that it cannot happen in their districts and probably they are right for the time being. But demand for No. 2 bundles has been easing in several centers and it is certain that the freer supply will lead to marked emphasis on bundle quality and shorter hauling.

The thing to remember is that the West Coast has been a scrap surplus area, newly introduced to shortage last winter. The ruptured ceiling is not expected to be extended.

Pittsburgh—The strike temporarily slowed scrap shipments in the district last week but movements were beginning to pick up as the mills returned to normal production. A short walkout of company railroad workers forced U. S. Steel Corp. to halt laying down of scrap at collection points on the line for several days last week. Inventories continued ample. But pressure is likely to continue until stocks approach the 45-day point. This is not likely to happen for 30 days in most cases.

Chicago — Mills had stopped shipments at the beginning of last week, were coming back in at week's end. Collections had been moving rather slowly in the face of a stormy demand picture. Openhearth continued going well, although there has been springboard cutting in both electric furnace and openhearth grades. One large consumer is buying electric furnace in Chicago area only, has at least a 90-day supply. Motor blocks are going into No. 2 heavy melting.

Philadelphia—The short strike had little effect on scrap in this district except to divert some shipments from mills which were closed tight to those which were operating or still accepting material. Improved inventories are indicated by certain mills which held up No. 2 steel and No. 2 bundle shipments. Some will no longer take truck shipments. Low phos market is easy and cast dead with little business and a further reduction in prices.

New York—The market was coming back to normal early this week after last week's steel shutdown lull in shipments. Some mills gave the green light on shipments on Friday of last week, others came into the market on Saturday, and the rest on Monday. The trade here notes a weakening in demand for No. 2 bundles and expects more emphasis on quality. There doesn't seem to be much chance that this grade will drop below ceiling in the near future.

Detroit—Dealers piled scrap in their yards last week and waited for releases from the mills. Electric mills released late Friday, but not Great Lakes, biggest scrap consumer. Great Lakes, however, received scrap during the strike at a nearby point. Ford furnaces operated and received scrap while other mills were down.

Cleveland — Dealer scrap started moving to the mills again early this week as the steel plants began climbing back to peak operations. Railroad and industrial scrap was shipped during the strike. Some quarters look for a tightening of the market due to declining shipments of agricultural scrap and scrap from the Southwest, lowered industrial activity and no apparent pickup in scrap generated by railroads. Cast continues dead.

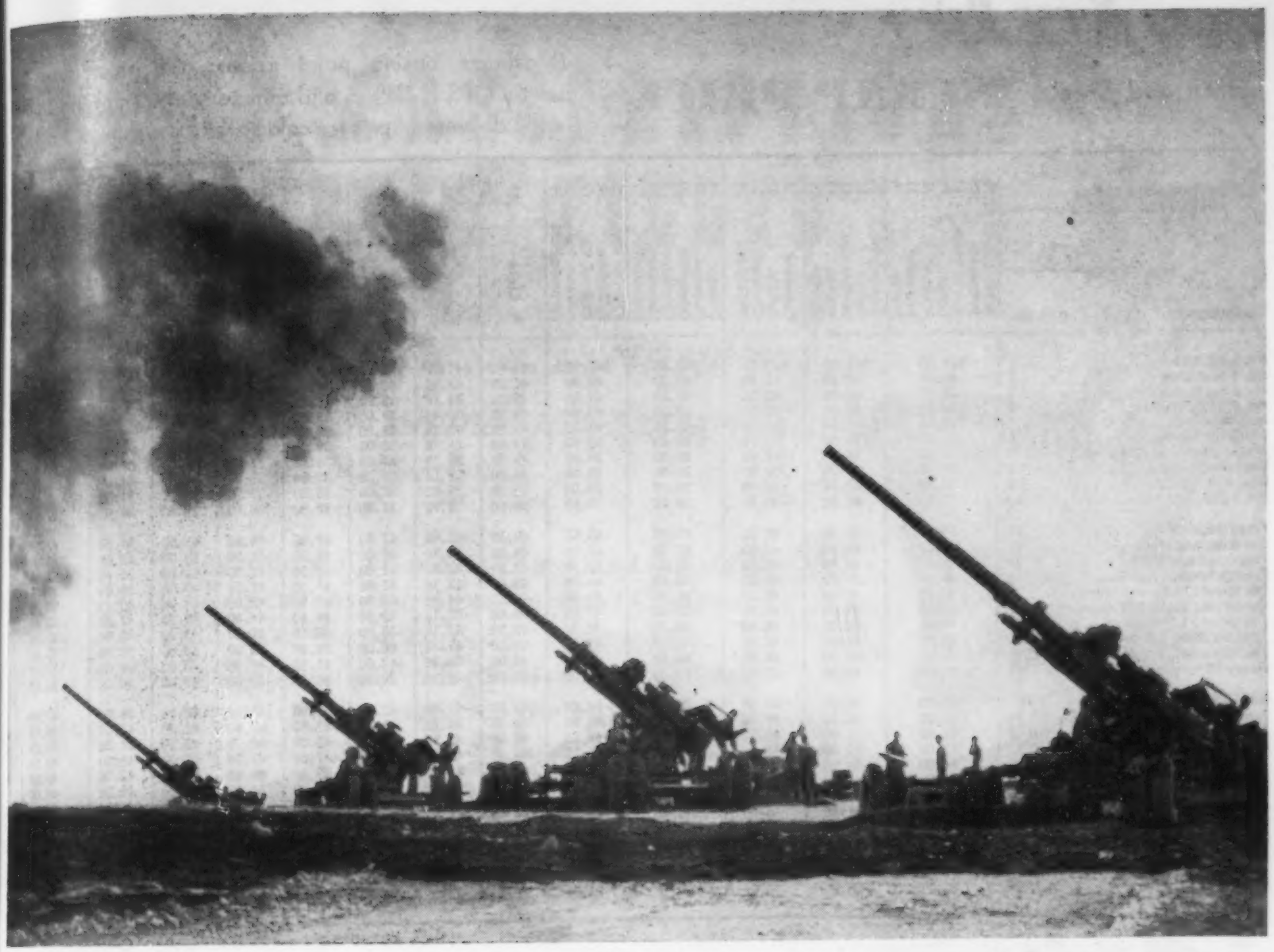
Birmingham—Scrap movements, at a standstill since the start of the steel strike, are greatly accelerated this week. Brokers, busy last week notifying shippers to hold up shipments, are just as busy now notifying them to get the scrap moving North.

St. Louis—Granite City Steel Co., only district steel mill affected by the strike last Friday, recalled all orders to stop shipments of scrap iron. All other consumers have been accepting shipments usual. Movement has been improved by good weather. Allocations for eastern mills generally have been completed.

Cincinnati—Mills in the area continued to take scrap in during the brief strike. One mill has been able to maintain and slightly build up inventories to an 18-day level this week. Another steel producer playing inventories close is hovering around a 9-day supply. Scrap movement is good and demand is holding up. Some sluggishness is reported on No. 2 bundles. Cast continues weak.

Boston — No new developments in this market, as the steel strike had no effect. Steel was moving well at ceiling prices with demand strong and shipments steady. Cast grades remained poor. There was virtually no traffic in stove plate.

Buffalo — Scrap market showed signs of easiness as heavy stocks accumulated on tracks because of the shutdown last week. Cast remained weak with sales of $4 to $5 below ceiling reported. Demand was poor.



Official Army photo, released by Dept. of Defense

It takes plenty of **SCRAP** *...to be ready for one!*

Like these antiaircraft gunners, America is fast raising its sights . . . on production of all types of heavy artillery for defense. Big guns require enormous quantities of nickel-bearing steel, which in turn requires enormous quantities of scrap . . . a full ton of it for every two tons of new steel. Keeping this kind of scrap moving to the mills is an industry-wide job . . . and our No. 1 specialty.

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Iron and Steel

SCRAP PRICES

(Maximum basing point prices, per gross ton, as set by OPS in CFR 5 and amendments. Shipping point and delivered prices calculated as shown below.)

| Switching Charge (Dollars per gross ton) → | | $0.99 | | |

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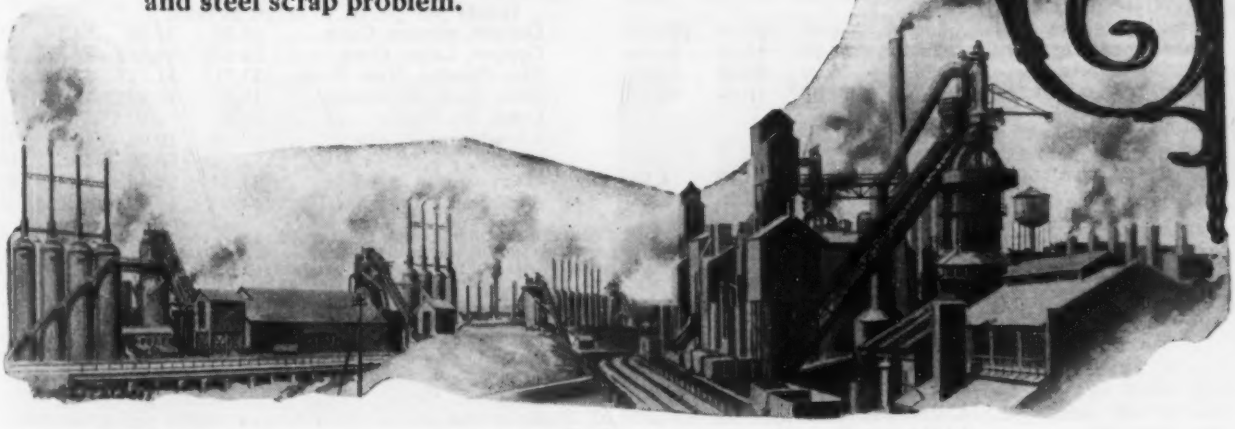
Compounding Scrap Prescriptions for Mills & Foundries Since 1889

Regardless of your scrap need, and individual specifications, Luria Brothers and Company, Inc. have the background, knowledge, organization and will to solve your problem competently . . . assuring the maximum production at the lowest cost.

Our offices, strategically located at the very fingertips of the steel industry, are ready to assume your every iron and steel scrap problem.



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CLEVELAND, OHIO	NEW YORK, N. Y.	SAN FRANCISCO, CAL.
	SEATTLE, WASH.	

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Flat-Rolled Steel: (cents per pound)	May 6, 1952	Apr. 29, 1952	Apr. 8, 1952	May 8, 1951
Hot-rolled sheets	3.60	3.60	3.60	3.60
Cold-rolled sheets	4.35	4.35	4.35	4.35
Galvanized sheets (10 ga)	4.80	4.80	4.80	4.80
Hot-rolled strip	3.50	3.50	3.50	3.50
Cold-rolled strip	4.75	4.75	4.75	4.75
Plate	3.70	3.70	3.70	3.70
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	36.75	36.75	36.75	36.50
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb.) cokes	$8.70	$8.70	$8.70	$8.70
Tinplate, electro (0.50 lb.)	7.40	7.40	7.40	7.40
Special coated mfg. ternes	7.50	7.50	7.50	7.50
Bars and Shapes: (cents per pound)				
Merchant bars	3.70	3.70	3.70	3.70
Cold finished bars	4.55	4.55	4.55	4.55
Alloy bars	4.30	4.30	4.30	4.30
Structural shapes	3.65	3.65	3.65	3.65
Stainless bars (No. 302)	31.50	31.50	31.50	31.25
Wrought iron bars	9.50	9.50	9.50	9.50
Wire (cents per pound)				
Bright wire	4.85	4.85	4.85	4.85
Rails (dollars per 100 lb)				
Heavy rails	$3.60	$3.60	$3.60	$3.60
Light rails	4.00	4.00	4.00	4.00
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$56.00	$56.00	$56.00	$56.00
Slabs, rerolling	56.00	56.00	56.00	56.00
Forging billets	66.00	66.00	66.00	66.00
Alloy blooms, billets, slabs	70.00	70.00	10.00	70.00
Wire Rod and Skelp: (cents per pound				
Wire rods	4.10	4.10	4.10	4.10
Skelp	3.35	3.35	3.35	3.35

Pig Iron: (per gross ton)	May 6, 1952	Apr. 29, 1952	Apr. 8, 1952	May 8, 1951
Foundry, del'd Phila.	$58.19	$57.97	$57.97	$57.77
Foundry, Valley	52.50	52.50	52.50	52.50
Foundry, Southern, Cin'ti	55.58	55.58	55.58	55.58
Foundry, Birmingham	48.88	48.88	48.88	48.88
Foundry, Chicago†	52.50	52.50	52.50	52.50
Basic, del'd Philadelphia	57.27	57.09	57.09	56.92
Basic, Valley furnace	52.00	52.00	52.00	52.00
Malleable, Chicago†	52.50	52.50	52.50	52.50
Malleable, Valley	52.50	52.50	52.50	52.50
Charcoal, Chicago	70.56	70.56	70.56	70.56
Ferromanganese‡	186.25	186.25	186.25	186.25

†The switching charges for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy pages.

Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$43.00*	$43.00*	$43.00*	$44.00*
No. 1 steel, Phila. area	41.50*	41.50*	41.50*	42.50*
No. 1 steel, Chicago	41.50*	41.50*	41.50*	42.50*
No. 1 bundles, Detroit	41.15*	41.15*	41.15*	41.15*
Low phos., Young'n	46.50*	46.50*	46.50*	46.50*
No. 1 cast, Pittsburgh	45.50‡	45.50‡	45.50‡	49.00†
No. 1 cast, Philadelphia	*44.50‡*	45.50‡	48.00‡	49.00†
No. 1 cast, Chicago	44.00‡	44.00‡	44.00‡	49.00†

* Basing Pt. † Shipping Pt.
Not including broker's fee after Feb. 7, 1951.
‡ Del'd., includes broker's fee.

Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75	$14.75	$14.75	$14.75
Foundry coke, prompt	17.75	17.75	17.75	17.75

Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	24.50	24.50	24.50	24.50
Copper, Lake, Conn.	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.215	$1.215	$1.215	$1.42
Zinc, East St. Louis	19.50	19.50	19.50	17.50
Lead, St. Louis	*16.80*	17.80	18.80	16.80
Aluminum, virgin	19.00	19.00	19.00	19.00
Nickel, electrolytic	59.58	59.58	59.58	53.55
Magnesium, ingot	24.50	24.50	24.50	24.50
Antimony, Laredo, Tex.	44.00	44.00	50.00	42.00

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.

	Finished Steel Base Price	Pig Iron	Scrap Steel
May 6, 1952	4.131¢ per lb.	$52.77 per gross ton	$42.00 per gross ton
One week ago	4.131¢ per lb.	52.72 per gross ton	42.00 per gross ton
One month ago	4.131¢ per lb.	52.72 per gross ton	42.00 per gross ton
One year ago	4.131¢ per lb.	52.69 per gross ton	43.00 per gross ton

	Finished Steel Base Price High	Finished Steel Base Price Low	Pig Iron High	Pig Iron Low	Scrap Steel High	Scrap Steel Low
1952	4.131¢ Jan. 1	4.131¢ Jan. 1	$52.72 Jan. 1	$52.72 Jan. 1	$42.00 Jan. 1	$42.00 Jan. 1
1951	4.131¢ Jan. 2	4.131¢ Jan. 2	52.72 Oct. 9	52.69 Jan. 2	47.75 Jan. 30	42.00 Oct. 23
1950	4.131¢ Dec. 1	3.837¢ Jan. 3	52.69 Dec. 12	45.88 Jan. 3	45.13 Dec. 19	26.25 Jan. 3
1949	3.837¢ Dec. 27	3.705¢ May 3	46.87 Jan. 18	45.88 Sept. 6	43.00 Jan. 4	19.33 June 28
1948	3.721¢ July 27	3.193¢ Jan. 1	46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
1947	3.193¢ July 29	2.848¢ Jan. 1	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.848¢ Dec. 31	2.464¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.464¢ May 29	2.396¢ Jan. 1	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.396¢	2.396¢	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.396¢	2.396¢	23.61	23.61	$19.17	$19.17
1942	2.396¢	2.396¢	23.61	23.61	19.17	19.17
1941	2.396¢	2.396¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	18.92 May 22
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.27207¢ May 16	22.61 Sept.19	20.61 Sept.12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	32.25 Mar. 9	20.25 Feb. 16	21.92 Mar.30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug.11	17.75 Dec. 21	12.67 June 8
1929	2.31773¢ May 28	2.26498¢ Oct. 29	1871 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

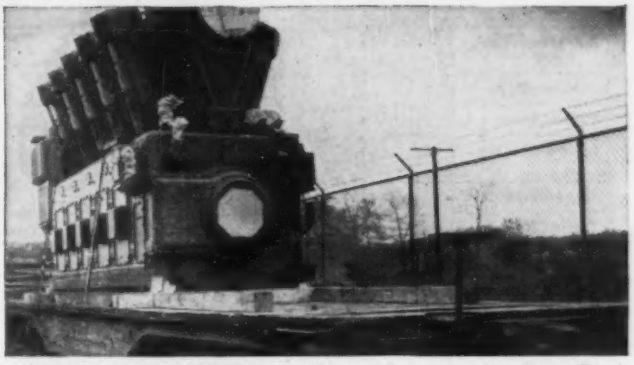
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Acme Steel Strapping Insures S.A. *(Safe Arrival)*

Saves time, money, materials, too!

THE TRUCK TURNED OVER, BUT THE LOAD WAS SAFE. Thirteen tons of breakable refractory hot top brick went into the ditch—and came out unharmed—because the shipper—Kaul Clay Products—had secured the load with Acme Steel strapping.



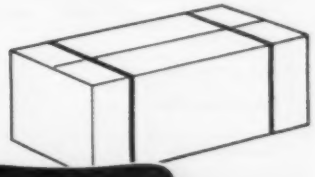
NINETY TONS OF POWER secured to a flat car with Acme Steel strapping. This giant Cooper-Bessemer engine made the long haul from Pennsylvania to Texas without shifting an inch. As one railroad man says, "There's never been a bad car with this method."

TIGHT SQUEEZE ON A LADY'S DRESS. Every week Paramount Printing & Finishing Co. ships out millions of yards of dress material. It's all compressed and then held under tension by Acme Steel strapping to save on shipping space.

AROUND THE WORLD. Here's beer, bound for overseas—bound to get there with Acme Steel strapping. That's Blatz in the picture. Acme Steel does the same good job for any product, canned, bottled or boxed, for any length journey anywhere.

You don't eat much, wear much, sleep much or do much without Acme Steel strapping coming into it some place. All or part of almost everything you use travels at least part way to you protected by steel strapping.

Acme Steel strapping not only gets things to you safe, it also reduces packing and shipping costs. We have many striking examples of this. Write for them to Acme Steel Products Division, Dept. IA 52.



ACME STEEL

ACME STEEL COMPANY

2825 Archer Avenue, Chicago 8, Illinois

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		INGOTS		BILLETS, BLOOMS, SLABS			PIPE SKELP	PIL-ING	SHAPES STRUCTURAL		STRIP			
		Carbon Forging Net Ton	Alloy Net Ton	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Steel Sheet	Carbon	Hi Str. Low Alloy	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy
EAST	Bethlehem, Pa.					$70.00 *B3*			3.70 *B3*	5.50 *B3*				
	Buffalo, N. Y.			$56.00 *B3*	$66.00 *B3, R3*	$70.00 *B3, R3*		4.45 *B3*	3.70 *B3*	5.50 *B3*	3.50 *B3, R3*	4.65 *B3*	4.95 *B3*	6.40 *B3*
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.				$73.00 *A2*	$77.00 *A2*					3.90 *A2*		5.55 *A2*	
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.			$56.00 *B3*	$66.00 *B3*	$70.00 *B3*			3.70 *B3*	5.50 *B3*	3.50 *B3*			
	Newark, N. J.													
	New Haven, Conn.											5.15 *A5* 5.85 *D1*		
	Phoenixville, Pa.								5.90 *P2*					
	Putnam, Conn.													
	Sparrows Pt., Md.										3.50 *B3*	4.65 *B3*	4.95 *A5, B3*	6.40 *B3*
	Worcester, Mass.													
	Trenton, N. J.											6.00 *R4*		
MIDDLE WEST	Alton, Ill.										3.95 *L1*			
	Ashland, Ky.										3.50 *A7*			
	Canton-Massillon				$66.00 *R3*	$70.00 *R3* $66.00 *T5*								
	Chicago, Ill.			$56.00 *U1*	$66.00 *U1, R3,W8*	$70.00 *U1, R3,W8*		4.45 *U1*	3.65 *U1, W8*	5.50 *U1*	3.50 *A1, W8*	4.90 *A1, I3*		
	Cleveland, Ohio				$66.00 *R3*							4.65 *A5, J3*		6.55 *A5* 6.70 *J3*
	Detroit, Mich.		$54.00 *R5*		$69.00 *R5*	$73.00 *R5*					4.40 *M2* 3.80 *G3*	4.85 *G3* 5.45 *M2* 5.60 *R5,D1*	5.95 *G3*	
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana			$56.00 *U1*	$66.00 *U1*	$70.00 *U1, Y1*		4.45 *I3*	3.65 *U1, I3*	5.50 *U1, I3* 6.00 *Y1*	3.50 *U1, Y1,I3*	4.90 *I3*	5.30 *U1, I3* 5.80 *Y1*	
	Granite City, Ill.													
	Kokomo, Ind.													
	Middletown, Ohio											4.65 *A7*		
	Niles, Ohio Sharon, Pa.										4.00 *S1*	5.35 *S1*	5.40 *S1*	6.55 *S1*
	Pittsburgh, Pa.	$52.00 *U1*	$54.00 *U1, C11*	$56.00 *U1*	$66.00 *U1*	$70.00 *U1, C11*	3.35 *U1* 3.45 *J3*	4.45 *U1*	3.65 *U1, J3*	5.50 *U1, J3*	4.00 *S9,S7* 3.75 *A3* 3.50 *J3,A7*	4.65 *J3,A7* 5.00 *A3* 5.35 *B4,S7*		
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.								3.90 *W3*		3.60 *W3*	4.65 *W3* 5.35 *F3*	5.75 *W3*	7.20 *W3*
	Youngstown, Ohio					$70.00 *Y1, C10*	3.35 *U1, R3*			6.00 *Y1*	3.50 *U1, R3, Y1*	4.65 *R3, Y1* 5.25 *C5,T4* 5.35 *B4*	5.30 *U1, R3* 5.80 *Y1*	6.55 *R3* 7.05 *Y1*
WEST	Fontana, Cal.	$79.00 *K1*	$80.00 *K1*	$75.00 *K1*	$85.00 *K1*	$89.00 *K1*			4.25 *K1*	6.10 *K1*	4.75 *K1*	6.30 *K1*	6.20 *K1*	6.95 *K1*
	Geneva, Utah				$66.00 *C7*				3.65 *C7*	5.50 *C7*				
	Kansas City, Mo.								4.25 *S2*		4.10 *S2*			
	Los Angeles, Calif.				$85.00 *B2*	$90.00 *B2*			4.25 *B2, C7*	6.05 *B2*	4.25 *B2,C7*	6.40 *C1*	6.05 *B2*	
	Minnequa, Colo.								4.10 *C6*		4.55 *C6*			
	San Francisco, Cal.				$85.00 *B2*				4.20 *B2*	6.00 *B2*	4.25 *C7,B2*		6.05 *B2*	
	Seattle, Wash.				$85.00 *B2*				4.30 *B2*	6.10 *B2*	4.50 *B2*		6.30 *B2*	
SOUTH	Atlanta, Ga.										4.05 *A8*			
	Birmingham, Ala.			$56.00 *T2*	$66.00 *T2*				3.65 *R3,T2*	5.50 *T2*	3.50 *R3,T2*		5.30 *T2*	
	Houston, Texas		$62.00 *S2*		$74.00 *S2*	$78.00 *S2*			4.05 *S2*		3.90 *S2*			

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL PRICES

SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE	
Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Terne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.	
													Bethlehem, Pa.
3.60 *B3*	4.35 *B3*				5.40 *B3*	6.55 *B3*			4.10 *W6*				Buffalo, N. Y.
										† Special coated mfg ternes deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb, deduct $2.20 from 1.25-lb coke base box. * COKES: 1.50-lb, add 25¢. ELECTRO: 0.50-lb, add 25¢;,0.75-lb, add,65¢.			Claymont, Del.
													Coatesville, Pa.
3.60 *A2*					5.65 *A2*								Conshohocken, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
									4.10 *B3*				Johnstown, Pa.
													Newark, N. J.
													New Haven, Conn.
													Phoenixville, Pa.
													Putnam, Conn.
3.60 *B3*	4.35 *B3*	4.80 *B3*			5.40 *B3*	6.55 *B3*	6.75 *B3*		4.20 *B3*	$8.55 *B3*	$7.25 *B3*		Sparrows Pt., Md.
									4.40 *A5*				Worcester, Mass.
									4.20 *R4*				Trenton, N. J.
									4.40 *L1*				Alton, Ill.
3.60 *A7*		4.80 *A7*	4.65 *A7*										Ashland, Ky.
		4.80 *R3*											Canton-Massillon
3.60 *W8*					5.40 *U1*				4.10 *A5,R3, N4*				Chicago, Ill.
3.60 *R3,J3*	4.35 *R3,J3*		4.65 *R3*		5.40 *R3,J3*	6.55 *R3,J3*			4.10 *A5*				Cleveland, Ohio
3.60 *G3* 4.40 *M3*	4.55 *G3*				5.95 *G3*	7.10 *G3*							Detroit, Mich.
													Duluth, Minn.
3.60 *U1, Y1,I3*	4.35 *U1, Y1,I3*	4.80 *U1,I3*	4.65 *U1,I3*	5.20 *U1*	5.40 *U1,I3* 5.90 *Y1*	6.55 *U1,I3* 7.05 *Y1*		5.40 *I3*	4.10 *Y1*	$8.45 *B3, U1, Y1*	$7.15 *U1,I3*	5.85 *U1* 5.30 *Y1*	Gary, Ind. Harbor, Indiana
3.30 *G2*	5.05 *G2*	5.50 *G2*	5.35 *G2*								$7.35 *G2*	6.05 *G2*	Granite City, Ill.
		5.20 *C9*											Kokomo, Ind.
	4.35 *A7*		4.65 *A7*	5.20 *A7*									Middletown, Ohio
3.25 *N3* 4.00 *S1*		6.00 *N3*		6.00 *N3*	5.40 *S1*								Niles, Ohio Sharon, Pa.
3.60 *U1, J3,A7* 3.75 *A3*	4.35 *U1, J3,A7*	4.80 *U1*	4.65 *U1*		5.40 *U1,J3*	6.55 *U1,J3*	7.20 *U1*		4.10 *A5* 4.30 *P6*	$8.45 *U1,J3*	$7.15 *U1,J3*	5.85 *U1*	Pittsburgh, Pa.
									4.30 *P7*				Portsmouth, Ohio
3.60 *W3,W5*	5.35 *F3* 4.35 *W3,W5*	4.80 *W3,W5*		5.20 *W3,W5*	5.75 *W3*	6.90 *W3*				$8.45 *W3,W5*	$7.15 *W3,W5*	6.15 *W5* 5.85 *F3*	Weirton, Wheeling, Follansbee, W. Va.
3.60 *U1, R3,Y1*	4.35 *R3, Y1*	5.50 *R1*	4.65 *Y1*	6.05 *E2*	5.40 *U1,R3* 5.90 *Y1*	6.55 *R3* 7.05 *Y1*		6.05 *R1,E2*	4.10 *Y1*	$8.45 *R3*	$7.15 *R3*		Youngstown, Ohio
4.35 *K1*	5.30 *K1*				6.35 *K1*	7.50 *K1*			4.90 *K1*				Fontana, Cal.
3.70 *C7*													Geneva, Utah
													Kansas City, Mo.
4.30 *C7*		5.55 *C7*						5.40 *C7*	4.90 *B2,C7*	$9.20 *C7*	$7.90 *C7*		Los Angeles, Cal.
									4.35 *C6*				Minnequa, Colo.
4.30 *C7*	5.30 *C7*	5.55 *C7*											San Francisco, Cal.
													Seattle, Wash.
													Atlanta, Ga.
3.60 *R3,T2*	4.35 *T2*	4.80 *R3,T2*			5.40 *T2*			4.75 *R3*	4.10 *R3,T2*	$8.55 *T2*	$7.25 *T2*		Birmingham, Ala.
									4.50 *S2*				Houston, Texas

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				4.30 *B3*	5.40 *B3*	5.55 *B3*					
	Buffalo, N. Y.	3.70 *B3,R3*	3.70 *B3,R3*	4.60 *B5*	4.30 *B3,R3*	5.40 *B3*	5.55 *B3*	3.70 *B3*				4.85 *W6*
	Claymont, Del.							4.15 *C4*		4.85 *C4*		
	Centerville, Pa.							4.15 *L4*		5.25 *L4*		
	Conshohocken, Pa.							4.15 *A2*	4.75 *A2*	5.05 *A2*	5.90 *A2*	
	Harrisburg, Pa.							6.30 *C3*	6.30 *C3*			
	Hartford, Conn.			5.10 *R3*		5.85 *R3*						
	Johnstown, Pa.	3.70 *B3*	3.70 *B3*		4.30 *B3*		5.55 *B3*	3.70 *B3*		4.75 *B3*	5.65 *B3*	4.85 *B3*
	Newark, N. J.			5.00 *W10*		5.75 *W10*						
	New Haven, Conn.											
	Phoenixville, Pa.											
	Putnam, Conn.			5.10 *W10*								
	Sparrows Point, Md.		3.70 *B3*					3.70 *B3*		4.75 *B3*	5.65 *B3*	4.95 *B3*
	Worcester, Mass.					5.75 *A5*						5.15 *A5,W6*
	Trenton, N. J.											
MIDDLE WEST	Alton, Ill.	4.15 *L1*										5.85 *L1*
	Ashland, Ky.							3.70 *A7*				
	Canton-Massillon	3.70 *R3*		4.55 *R3,R2*	3.95 *T5* 4.30 *R3*	4.90 *T5* 5.40 *R3,R2*						
	Chicago, Ill.	3.70 *U1,R3, W8*	3.70 *R3*	4.55 *A5,B5, W8,W1*	4.30 *U1,R3, W8*	5.40 *R3,W8, W10,B5,L2* 5.45 *A5*		3.70 *U1,W8*	4.75 *U1*	4.75 *U1*	5.65 *U1*	5.10 *W7* 4.85 *R3,A5, K2,N4*
	Cleveland, Ohio	3.70 *R3*	3.70 *R3*	4.55 *A5,C13*		5.45 *A5*	5.55 *R3,J3*	3.70 *R3,J3*	4.75 *J3*		5.65 *R3,J3*	4.85 *A5,C13*
	Detroit, Mich.	3.85 *R5*		4.70 *P8,R5* 4.80 *P3*	4.45 *R5* 4.65 *G3*	5;50 *R5* 5.55 *P8* 5.60 *P3*						
	Duluth, Minn.											4.85 *A5*
	Gary, Ind. Harbor, Indiana	3.70 *U1, Y1, I3*	3.70 *U1,I3, Y1*	4.55 *R3,M5, L2*	4.30 *U1,I3, Y1*	5.40 *R3,M5, L2*	5.55 *U1,I3* 6.05 *Y1*	3.70 *U1,I3, Y1*	4.75 *I3*	4.75 *U1*	5.65 *U1,I3* 6.15 *Y1*	5.10 *M4*
	Granite City, Ill.							4.40 *G2*				
	Kokomo, Ind.											4.95 *C9*
	Middletown, Ohio											
	Niles, Ohio Sharon, Pa.							3.95 *S1*		5.20 *S1*	5.70 *S1*	
	Pittsburgh, Pa.	3.70 *U1,J3*	3.70 *U1,J3*	4.55 *R3,A5, J3,S8,W10, C8*	4.30 *U1,C11*	5.40 *C11,S8, W10,C8,A5*	5.55 *U1,J3*	3.70 *U1,J3*	4.75 *U1*	4.75 *U1*	5.65 *U1,J3*	4.85 *A5,J3* 5.10 *P6*
	Portsmouth, Ohio											5.25 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	3.85 *W3*						4.00 *W3,W5*				
	Youngstown, Ohio	3.70 *U1,R3, Y1*	3.70 *U1,R3, Y1*	4.55 *Y1,F2*	4.30 *U1, Y1, C10*	5.40 *Y1,C10, F2*	5.55 *U1* 6.05 *Y1*	3.70 *U1,R3, Y1*			5.65 *R3* 6.15 *Y1*	4.85 *Y1*
WEST	Fontana, Cal.	4.40 *K1*	4.40 *K1*		5.35 *K1*		6.60 *K1*	4.30 *K1*		5.70 *K1*	6.25 *K1*	
	Geneva, Utah							3.70 *C7*			5.65 *C7*	
	Kansas City, Mo.	4.30 *S2*	4.30 *S2*		4.90 *S2*							5.45 *S2*
	Los Angeles, Cal.	4.40 *C7,B2*	4.40 *C7,B2*	6.00 *B2,R3*	5.35 *B2*		6.25 *B2*					5.80 *C7,B2*
	Minnequa, Colo.	4.15 *C6*	4.50 *C6*					4.50 *C6*				5.10 *C6*
	San Francisco, Cal.	4.45 *B2* 4.40 *C7*	4.45 *B2* 4.40 *C7*				6.30 *B2*					5.80 *C7*
	Seattle, Wash.	4.45 *B2*	4.45 *B2*				6.30 *B2*	4.60 *B2*			6.55 *B2*	
SOUTH	Atlanta, Ga.	4.25 *A8*	4.25 *A8*									5.10 *A8*
	Birmingham, Ala.	3.70 *R3,T2*	3.70 *R3,T2*				5.55 *T2*	3.70 *R3,T2*			5.65 *T2*	4.85 *R3,T2*
	Houston, Tex.	4.10 *S2*	4.10 *S2*		4.70 *S2*			4.10 *S2*				5.25 *S2*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin Inc., Harvey, Ill.

C1 California Cold Rolled Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Steel Corp., Claymont, Del.
C5 Cold Metal Products Co., Youngstown
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia-Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Glassport, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago

K1 Kaiser Corp., Oakland, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Co., Pittsburgh
N3 Niles Rolling Mills Co., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.

O1 Oliver Iron & Steel Co., Pittsburgh

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div. Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co. (John A.), Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sloss Sheffield Steel & Iron Co., Birmingham
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Sweet's Steel Co., Williamsport, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal, Iron & R. R. Co., Birmingham
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Steel Co., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.

U1 United States Steel Co., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Co., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh

Y1 Youngstown Sheet & Tube Co., Youngstown

Steel Prices

Base price, f.o.b., dollars per 100 lb. *(Metropolitan area delivery add 20¢ except B'ham, San Fran., Cincinnati, New Orleans, St. Paul, add 15¢; Memphis, add 10¢; Phila., add 25¢; N. Y., add 30¢.)

WAREHOUSES	Sheets			Strip		Plates	Shapes	Bars		Alloy Bars			
Cities	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled	Standard Structural	Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4615 As rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4615 As rolled	Cold-Drawn A 4140 Annealed
Baltimore	5.54–6.44	6.80–7.05	8.20	6.03	.....	6.13	6.13	6.01	6.63	.....	.....	.....	.....
Birmingham*	5.59	6.37	7.20–7.35[1]	5.54	.....	5.85	5.70	5.52	7.60	.....	.....	.....	.....
Boston	6.20	6.98	8.35–8.59	6.15–6.50	7.74–8.70	6.38–6.63	6.20–6.22	6.05–6.88	6.61–6.99	10.25–10.30	10.55–11.50	11.95	12.15–12.25
Buffalo	5.50–5.54	6.28–6.32	8.20–8.23	5.86–6.10	.....	5.89–5.98	5.80–5.82	5.52–5.55	6.18–6.45	10.15	10.45–10.48	11.80	12.10–12.13
Chicago	5.54	6.32	7.85	5.49	.....	5.65–5.70	5.65	5.47	6.05–6.30	.....	10.10	.....	11.75
Cincinnati*	5.84	6.38	8.29	5.77	.....	6.14	6.09	5.75	6.64	.....	10.49	.....	12.14
Cleveland	5.54	6.32	7.96–7.98	5.65	.....	5.82–5.95	5.95–5.98	5.77–5.95	6.15–6.40	.....	10.21	.....	11.86
Detroit	5.76	6.50	8.47	6.15	.....	6.14	6.09	5.74	6.64	.....	10.45	.....	12.10
Houston	6.35–6.58	7.37–8.09	8.57	6.15	.....	6.39–6.42	6.32–6.35	6.38	8.38–8.63	10.95	11.12–11.25	11.40	12.62–12.90
Indianapolis, del'd	5.94	6.72	8.25	5.89	.....	6.10	6.05	5.87	6.80	.....	10.50	.....	.....
Kansas City	6.22–6.40	7.64–7.68	8.66–8.70	6.10–6.90	7.81	6.38–6.74	6.43–6.48	6.20–6.77	7.01–7.22	10.00	10.10	11.50	11.80
Los Angeles	6.30	8.10–8.45	9.30–9.35	6.40	10.45	6.30	6.30	6.25–6.35	8.15	11.30	11.30	13.05	13.50
Memphis*	6.25	7.03	7.51	6.20	.....	6.36	6.36–6.61	6.33–6.57	7.11	.....	.....	.....	.....
Milwaukee	5.70	6.48	8.01	5.65	.....	5.81–5.86	5.81	5.63	6.31–6.61	.....	10.26	.....	.....
New Orleans*	5.98	7.01	8.26	5.93	.....	6.09	6.09	5.91	7.02	.....	.....	.....	.....
New York*	6.09–6.52	6.87–6.91	8.25–8.45	6.27–7.19	7.67	6.44–6.88	6.07–6.40	6.19–6.42	6.99–7.29	10.45	10.48–10.75	12.10	11.40–12.40
Norfolk	6.68	.....	.....	6.33	.....	6.20	6.20	5.95	7.30	.....	.....	.....	.....
Philadelphia*	5.79–6.07	6.72–7.22	8.10–8.38	6.08–6.35	7.15	6.05–6.19	5.84–6.09	6.02–6.27	6.91–7.16	9.82–10.17	10.22–10.47	11.82	11.88–12.12
Pittsburgh	5.54	6.32	7.85–8.25	5.59–5.84	.....	5.65–5.70	5.65	5.47	6.15–6.40	.....	10.10	.....	11.75
Portland	7.25	8.70–9.00	9.10–9.25	7.30	.....	6.80	7.17	7.00	8.65	.....	.....	.....	.....
Salt Lake City	7.95	.....	9.80–10.35	8.00	.....	7.45	7.60	7.95	.....	.....	.....	.....	.....
San Francisco*	6.51–6.59	7.88–8.23	9.10–9.25	6.44–6.60	10.45	6.40–6.50	6.25	6.34–6.45	8.15–8.20	11.30	11.30	13.05	13.50
Seattle	6.14–6.81	7.84–8.44	9.55	7.40–7.70	.....	6.63–6.78	6.50–6.70	6.50	8.80–8.85	.....	.....	.....	.....
St. Louis	5.73–5.82	6.60–7.15	8.13	5.77–6.36	7.66	6.02–6.07	6.02–6.22	5.75–5.80	6.43–6.68	10.08	10.38	11.73	12.03
St. Paul*	6.14	6.92	8.45	6.09	.....	6.25	6.25	6.07	6.75	.....	.....	.....	.....

BASE QUANTITIES (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanizing sheets, for quantity.
EXCEPTIONS: (1) 500 to 1499 lb.

STAINLESS STEELS

Base price, cents per lb, f.o.b. mill

Product	301	302	303	304	316	321	347	410	416	430
Ingots rerolling	14.25	15.25	16.75	16.25	24.75	20.00	21.75	12.75	14.75	13.00
Slabs billets rerolling	18.50	20.00	22.00	21.00	32.25	26.25	28.50	16.50	20.00	16.75
Forg. discs die blocks rings	34.00	34.25	36.75	35.75	53.00	40.25	44.75	28.00	28.50	28.50
Billets forging	26.25	26.50	28.50	27.75	41.50	31.25	35.00	21.50	22.00	22.00
Bars wires structurals	31.25	31.50	34.00	33.00	49.25	37.00	41.50	25.75	26.25	26.25
Plates	33.00	33.25	35.25	35.25	52.00	40.75	45.25	27.00	27.50	27.50
Sheets	41.00	41.25	43.25	43.25	57.00	49.25	53.75	36.50	37.00	39.00
Strip hot-rolled	26.50	28.25	32.50	30.25	48.75	37.00	41.25	23.50	30.25	24.00
Strip cold-rolled	34.00	36.75	40.25	38.75	59.00	48.25	52.25	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* McKeesport, Pa., *U1;* Washington, Pa., *W2;* (type 316 add 4.5¢) *J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Ft. Wayne, *J4;* Lockport, N. Y., *R4.*
Strip: Midland, Pa., *C11;* Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* (type 316 add 4.5¢); W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton-Massillon, O., *R3;* Middletown, O., *A7;* Harrison, N. J., *D3;* Youngstown, *C5;* Lockport, N. Y., *S4;* Sharon, Pa., *S1* (type 301 add ¼¢); Butler, Pa., *A7;* Wallingford, Conn., *W1.*
Bars: Baltimore, *A7;* Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R3;* Chicago, *U1;* Syracuse, N. Y. *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Lockport, N. Y., *S4;* Canton, O., *T5;* Ft. Wayne, *J4.*
Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* F. Wayne, *J4;* Trenton, N. J., *R4;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2.*
Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11.*
Plates: Brackenridge, Pa., *A3* (type 416 add ½¢); Butler, Pa., *A7;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Lockport, N. Y., *S4;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3.*
Forged discs, die blocks, rings: Pittsburgh, *C11;* Syracuse, *C11;* Ferndale, Mich., *A3;* Washington, Pa., *J2.*
Forging billets: Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11.*
ALLEGHENY LUDLUM—Slightly higher on Type 301; slightly lower on others in 300 series.
WASHINGTON STEEL—Slightly lower on 300 series except where noted.

PIPE AND TUBING

Base discounts, f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS					
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½-3 In.		3½-4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																				
Sparrows Pt. *B3*	34.0	12.0	37.0	16.0	39.0	19.5	40.0	20.0	40.5	21.0	41.0	21.5	41.5	22.0						
Cleveland *R3*	36.0	14.0	39.0	18.0	41.5	21.5	42.9	22.0	42.5	23.0	43.0	23.5	43.5	24.0						
Oakland *K1*	25.0	3.0	28.0	7.0	30.5	10.5	31.0	11.0	31.5	12.0	32.0	12.5	32.5	13.0						
Pittsburgh *J3*	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.5	8.0	32.5	11.5	34.5	13.5
Pittsburgh *N2*	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
Alton, Ill. *L1*	35.0	13.0	38.0	17.0	40.5	20.5	41.0	21.0	41.5	22.0	42.0	22.5	42.5	23.0						
Sharon *M3*	36.0	13.0	39.0	17.0	41.5	21.0	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.0						
Pittsburgh *N1*	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5		32.5		34.5	
Wheeling *W5*	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0						
Wheatland *W4*	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5						
Youngstown *Y1*	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
EXTRA STRONG PLAIN ENDS																				
Sparrows Pt. *B3*	33.5	13.0	37.5	17.0	39.5	20.5	40.0	21.0	40.5	22.0	41.0	22.5	41.5	23.0						
Cleveland *R3*	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0						
Oakland *K1*	24.5	4.0	28.5	8.0	30.5	11.5	31.0	12.0	31.5	13.0	32.0	13.5	32.5	14.0						
Pittsburgh *J3*	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.0	7.5	33.0	12.0	36.5	15.5
Pittsburgh *N2*	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0	36.5	17.5
Alton, Ill. *L1*	32.5	12.0	36.5	16.0	38.5	19.5	39.0	20.0	39.5	21.0	40.0	21.5	40.5	22.0						
Sharon *M3*	35.5	14.0	39.5	18.0	41.5	21.0	42.0	21.5	42.5	22.0	43.0	22.5	43.5	23.0						
Pittsburgh *N1*	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0		33.0		36.5	
Wheeling *W5*	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0						
Wheatland *W4*	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5						
Youngstown *Y1*	35.5	15.0	39.5	19.0	41.0	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	26.0	29.0	10.0	33.0	14.0	36.5	17.5

Galvanized discounts based on zinc, at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ¼ pt. Calculate discounts on even cents per lb of zinc, i. e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢.

Threads only, buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 3½ pts. higher discount. Buttweld jobbers' discount, 5 pct. East St. Louis zinc price now 19.50¢.

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$14.50 to $15.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	$17.50 to $18.00
Foundry, oven coke	
Buffalo, del'd	$26.69
Chicago, f.o.b.	23.00
Detroit, f.o.b.	24.00
New England, del'd	24.80
Seaboard, N. J., f.o.b.	22.75
Philadelphia, f.o.b.	22.70
Swedeland, Pa., f.o.b.	22.60
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	23.50
Cleveland, del'd	25.72
Cincinnati, del'd	25.06
St. Paul, f.o.b.	22.50
St. Louis	25.40
Birmingham, del'd	21.69
Neville Island	23.00

ELECTRICAL SHEETS

22 Ga. H-R cut length F.o.b. Mill Cents Per Lb.	Armature	Elec.	Muir	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beech Bottom *W5*		7.25	8.50	9.30	9.85	10.40	11.10
Brackenridge *A3*		7.25	8.50	9.30	9.85		
Granite City *G3*		7.95	9.20				
Ind. Harbor *B3*	6.75	7.25					
Mansfield *E2*	7.25	7.75	9.00	9.80			
Niles, O. *N3*	7.05	7.55					
Vandergrift *U1*	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Warren, O. *R3*	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Zanesville *A7*	6.75	7.25	8.50	9.30	9.85	10.40	11.10

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Bl. Furnace Silvery	Low Phos. Charcoal
Bethlehem *B3*	54.00	54.50	55.00	55.50			
Birmingham *R3*	48.38	48.88					
Birmingham *W9*	48.38	48.88					
Birmingham *S5*	48.38	48.88					
Buffalo *R3*	52.00	52.50	53.00				
Buffalo *H1*	52.00	52.50	53.00			63.75	
Chicago *I4*	52.00	52.50	52.50	53.00			
Cleveland *A5*	52.00	52.50	52.50	53.00	57.00		
Cleveland *R3*	52.00	52.50	52.50				
Daingerfield, Tex. *L3*	48.00	48.50	48.50				
Duluth *I4*	52.00	52.50	52.50	53.00			
Erie *I4*	52.00	52.50	52.50	53.00			
Everett, Mass. *M6*		59.75	60.25				
Fontana *K1*	58.00	58.50					
Geneva, Utah *U1, Y1*	52.00	52.50	52.50	53.00			
Granite City, Ill. *K3*	53.90	54.40	54.90				
Hubbard, Ohio *Y1*	52.00	52.50	52.50				
Ironton, Utah *C7*	52.00	52.50					
Jackson, Ohio *J1, G1*						62.50	
Lyle, Tenn. *T3*							66.00
Monessen *P6*	54.00						
Neville Island *P4*	52.00	52.50	52.50	53.00			
Pittsburgh *U1*	52.00			53.00			
Sharpsville *S3*	52.00	52.50	52.50	53.00			
Steelton *B3*	54.00	54.50	55.00	55.50	60.00		
Swedeland *A2*	56.00	56.50	57.00	57.50			
Toledo *I4*	52.00	52.50	52.50	53.00			
Troy, N. Y. *R3*	54.00	54.50	55.00		60.00		
Youngstown *Y1*	52.00	52.50	52.50	53.00			
N. Tonawanda, N. Y. *T1*		52.50	53.00				

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base, (1.75 to 2.25 pct, except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 pct and over. Silvery Iron: Add $1.50 per net ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferrosil on prices are $1 over comparable silvery iron.

BOILER TUBES

Per 100 ft. cut, 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	22.67	26.66	21.99	25.86
	2½	12	29.48	35.84	29.57	34.76
	3	12	33.90	39.90	32.89	38.70
	3½	11	42.37	49.89	41.10	48.39
	4	10	52.60	61.88	51.03	60.02
National Tube	2	13	21.62	26.48		
	2½	12	29.65	36.32		
	3	12	34.00	41.64		
	3½	11	40.34	49.41		
	4	10	51.21	62.72		
Pittsburgh Steel	2	13		27.08		
	2½	12	30.49	37.15		
	3	12	34.95	42.59		
	3½	11	41.48	50.54		
	4	10	52.65	64.10		

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	$105.30 to $108.80
6 to 24-in., del'd N.Y.	108.50 to 109.50
6 to 24-in., Birmingham	91.50 to 96.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipment less	$123.00 to $130.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

C-R SPRING STEEL

Cents Per Lb. F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bridgeport, Conn. *S7*	5.35	6.80	7.40	9.35	11.65
Carnegie, Pa. *S9*		6.80	7.40	9.35	11.65
Cleveland *A5*	4.65	6.45	7.40	9.35	11.65
Detroit *D1*	5.60	6.65	7.25		
New Castle, Pa. *B4*	5.35	6.80	7.40	9.35	
New Haven, Conn. *D1*	5.85	6.75	7.35		
Sharon, Pa. *S1*	5.35	6.80	7.40	9.35	11.65
Weirton, W. Va. *W3*	5.35	6.80	7.40	9.35	11.65
Worcester, Mass. *A5*	4.95	6.75	7.70	9.65	11.95
Youngstown *C5*		6.80	7.40	9.35	11.65

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Base Col.	Woven Wire Fence 9–15½ ga. Base Col.	Fence Posts Base Col.	Single Loop Bale Ties Base Col.	Twisted Barbless Wire Base Col.	Galv. Barbed Wire Base Col.	Merch. Wire Annealed ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	118	126	....	123	....	136	5.70	5.95
Aliquippa, Pa. *J3*	118	132	....	....	136	140	5.70	6.15
Atlanta *A8*	121	133	....	126	126	143	5.95	6.40
Bartonville *K2*	118	130	....	123	143	143	5.70	6.15
Buffalo *W6*							4.85	....
Cleveland *A6*	125	....	....	....	....	....	5.70	6.15
Cleveland *A5*	....	....	....	....	....	....	5.70	6.15
Crawfrdsvl. *M4*	....	132	....	....	....	145	5.95	6.40
Donora, Pa. *A5*	118	130	....	123	140	140	5.70	6.15
Duluth *A5*	118	130	....	123	140	140	5.70	6.15
Fairfield, Ala. *T2*	118	130	....	123	....	140	5.70	6.15
Houston *S2*	126	138	....	....	....	148	6.10	6.55
Johnstn., Pa. *B3*	118	130	....	....	140	....	5.70	6.15
Joliet, Ill. *A5*	118	130	....	123	....	140	6.70	6.15
Kokomo, Ind. *C9*	120	132	....	125	138	142	5.80	6.05
Los Angeles *B2*	....	....	....	....	....	....	6.65	....
Kansas City *S2*	130	....	....	135	....	152	6.30	6.75
Minnequa *C6*	123	138	130	128	146	146	5.95	6.45
Monessen *P6*	124	135	....	....	....	145	5.95	6.40
Moline, Ill. *R3*	....	....	136	....	....	....	....	....
Pittsburg, Cal. *C7*	137	....	....	147	156	160	6.65	6.80
Portsmouth *P7*	124	137	....	....	....	147	6.10	6.60
Rankin, Pa. *A5*	118	130	....	....	....	140	5.70	6.15
So. Chicago *R3*	118	126	140	123	....	136	5.70	5.95
S. San Fran. *C6*	....	....	....	147	....	160	6.65	7.10
Sparrows Pt. *B3*	120	....	....	125	142	142	5.80	6.25
Sterling, Ill. *N4*	118	130	....	123	140	140	5.70	6.15
Struthers, O. *Y1*	....	....	....	....	....	....	6.70	6.15
Torrance, Cal. *C7*	138	....	....	....	....	....	6.65	....
Worcester *A5*	124	....	....	....	....	....	6.00	6.45
Williamsport, Pa. *S10*	....	....	150	....	....	....	....	....

Cut Nails, carlands, base $7.35 per 100 lb. (less 20¢ to jobbers), at Conshohocken, Pa., (*A2*), Wheeling, W. Va (*W5*), $7.15.

* Alabama City and So. Chicago don't include zinc extra

Miscellaneous Prices

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb.	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Axles	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	3.60	4.00	4.70	....	....	....	....	....
Chicago *R3*	....	....	....	6.15	....	....	....	....
Cleveland *R3*	....	....	....	....	....	9.35	....	....
Easley *T2*	3.60	4.00	....	....	....	....	....	....
Fairfield *T2*	....	4.00	4.70	6.15	5.60	....	4.50	9.80
Gary *U1*	3.60	4.00	....	....	....	....	4.50	....
Ind. Harbor *I3*	3.60	....	4.70	6.15	5.60	....	4.50	....
Johnstown *B3*	....	4.00	....	....	5.60	....	....	....
Joliet *U1*	....	4.00	4.70	....	....	....	....	....
Kansas City *S2*	....	....	....	6.40	....	....	....	9.85
Lackawanna *B3*	3.60	4.00	4.70	....	....	....	4.50	....
Lebanon *B3*	....	....	....	6.15	....	9.35	....	9.85
Minnequa *C6*	3.60	4.50	4.70	6.15	....	....	4.50	9.85
Pittsburgh *R3*	....	....	....	....	....	9.35	....	....
Pittsburgh *O1*	....	....	....	....	....	9.35	....	9.85
Pittsburgh *P3*	....	....	....	....	....	....	....	9.85
Pittsburgh *J3*	....	....	....	6.15	....	....	....	....
Pitts., Cal. *C7*	....	....	....	....	....	....	4.65	....
Seattle *B2*	....	....	....	6.65	....	....	4.65	....
Steelton *B3*	3.60	....	4.70	....	....	....	4.50	....
Struthers *Y1*	....	....	....	6.15	....	....	....	....
Torrance *C7*	....	....	....	....	....	....	4.65	....
Youngstown *R3*	....	....	....	6.15	....	....	....	....

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.505
18	4	1	—	5	$2.13
18	4	2	—	—	$1.65
1.5	4	1.5	8	—	81.0¢
6	4	2	6	—	96.5¢

High-carbon chromium ..... 63.5¢
Oil hardened manganese ..... 35¢
Special carbon ..... 32.5¢
Extra carbon ..... 27¢
Regular carbon ..... 23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

CLAD STEEL

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. *L4*	*29.5	
Washington, Pa. *J2*	*29.5	
Claymont, Del. *C4*	*28.00	
Conshohocken, Pa. *A2*		*27.50
New Castle, Ind. *I2*	*29.77	*26.24
Nickel-carbon		
10 pct Coatesville, Pa. *L4*	32.5	
Inconel-carbon		
10 pct Coatesville, Pa. *L4*	40.5	
Monel-carbon		
10 pct Coatesville, Pa. *L4*	33.5	
No. 302 Stainless-copper stainless, Carnegie, Pa. *A4*		77.00
Aluminized steel sheets, hot dip, Butler, Pa. *A7*		7.75

*Includes annealing and pickling, or sandblasting.

ELECTRODES

Cents per lb, f.o.b., plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
	GRAPHITE	
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2½	24, 30	23.15
2	24, 30	25.36
	CARBON	
40	100, 110	8.03
35	65, 110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
20	84, 90	8.03
17	60, 72	8.03
14	60, 72	8.57
10, 12	60	8.84
8	60	9.10

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective CaF_2 content:
70% or more $43.00
60% or less 40.00

From the viewpoint of many persons interested in manufacturing, there are many *new* developments taking place on the industrial front in New Jersey today.

Of particular interest is a *new* booklet about New Jersey. Entitled "An Industrialist's View of the Crossroads of the East", this brochure presents the *new* facts, the *new* figures and the *new* developments taking place now in industrial New Jersey.

There's a lot of *news* at the Crossroads—*new* research plants, *new* steel mills, *new* highways, *new* markets, *new* opportunities for plant sites. If you want to know what's *new* in New Jersey, write today for your copy of "An Industrialist's View of the Crossroads of the East".

• •

Write Box F, Public Service Electric and Gas Company, 70 Park Place, Newark, N. J. for the new brochure, "An Industrialist's View of the Crossroads of the East".

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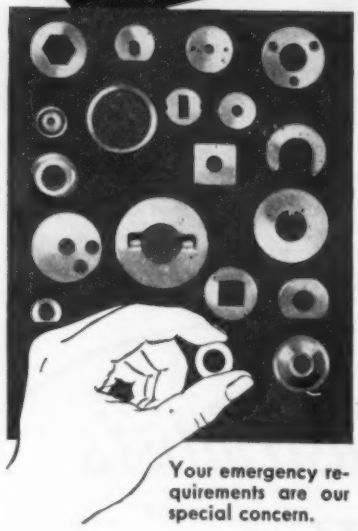

A DEPENDABLE SUPPLIER FOR 38 YEARS . . .

Your requirements for standard and special steel washers are sure to be satisfied at Joliet. A bank containing thousands of special dies in many shapes and forms, 9/32" to 8" O.D., gauges No. 28 to 3/8", stands ready to answer your needs. A VARIETY OF FINISHES IS AVAILABLE to meet your special needs, including: Electro-plating, Galvanizing, Parkerizing, and Cyanide hardening.

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JOLIET WROUGHT WASHER CO.

25 YEARS OF LEADERSHIP IN FASTENINGS OF STAINLESS STEEL

To YOU, Anti-Corrosive's 25th Anniversary is an assurance that the oldest, largest and best known firm dealing exclusively in stainless steel fastenings is best suited to serve your needs in this field.

Still Plenty of Fastenings IN STOCK

For quick delivery of stainless steel fastenings, check Anti-Corrosive first, since many stock items and alternates are on hand!

FREE - A - N Fastening Selector !

Write for handy slide Chart No. 52K — instantly identifies A-N Nos. pertaining to stainless fastenings, gives sizes, other data. Catalog available.

1927–1952

Anti-Corrosive Metal Products Co., Inc.

Manufacturers of STAINLESS STEEL FASTENINGS

CASTLETON ON HUDSON, NEW YORK

—Miscellaneous Prices—

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched—Sq.

	Pct Off List			
	Less Keg.	K. Reg.	Less Keg.	K. Hvy.
½ in. & smaller.	15	28½	15	28½
9/16 in. & ⅝ in.	12	25	6½	21
¾ in. to 1½ in. inclusive	9	23	1	16½
1⅝ in. & larger.	7½	22	1	16½

Nuts, Hot Pressed—Hexagon

½ in. & smaller.	26	37	22	34
9/16 in. & ⅝ in.	16½	29½	6½	21
¾ in. to 1½ in. inclusive	12	25	2	17½
1⅝ in. & larger.	8½	23	2	17½

Nuts, Cold Punched—Hexagon

½ in. & smaller.	26	37	22	34
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1½ in. inclusive	19½	31½	12	25
1⅝ in. & larger.	12	25	6½	21

Nuts, Semi-Finished—Hexagon

	Reg.		Hvy.	
½ in. & smaller.	35	45	28½	29½
9/16 in. & ⅝ in.	29½	40½	22	34
¾ in. to 1½ in. inclusive	24	36	15	28½
1⅝ in. & larger.	13	26	8½	23
	Light			
7/16 in. & smaller	35	45		
½ in. thus ⅝ in.	28½	39½		
¾ in. to 1½ in. inclusive	26	37		

Stove Bolts — *Pct Off List*

Packaged, steel, plain finished	48—10
Packaged, plate finish	31—10
Bulk, plain finish**	62*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets — *Base per 100 lb*

½ in. & larger	$7.85

Cap and Set Screws

(In bulk)	*Pct Off List*
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	54
¾ in. thru 1 in. up to & including 6 in.	48
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat	46
¾ in. thru 1 in. up to & including 6 in.	41
Milled studs	35
Flat head cap screws, listed sizes ...	16
Fillister head cap, listed sizes	34
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	53

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	15	28½
9/16 in. & ⅝ in. x 6 in. & shorter	18½	30½
¾ in. & larger x 6 in. & shorter	17½	29½
All diam. longer than 6 in...	14	27½
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Plow bolts	34	.....

—Miscellaneous Prices—

REFRACTORIES

Fire Clay Brick

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5)	$94.60
No. 1 Ohio	88.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	88.00
No. 2 Ohio	79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	13.75

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$94.60
Childs, Pa.	99.00
Hays, Pa.	100.10
Chicago District	104.50
Western Utah and Calif.	111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago	111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	16.50
Silica cement, net ton, bulk, Hays, Pa.	18.70
Silica cement, net ton, bulk, Ensley, Ala.	17.60
Silica cement, net ton, bulk, Chicago District	17.60
Silica cement, net ton, bulk, Utah and Calif.	24.70

Chrome Brick — *Per Net Ton*

Standard chemically bonded balt., Chester	$82.00

Magnesite Brick

Standard, Baltimore	$104.00
Chemically bonded, Baltimore	93.00

Grain Magnesite — *St. ⅜-in. grains*

Domestic, f.o.b. Baltimore in bulk fines removed	$62.70
Domestic, f.o.b. Chewalah, Wash., in bulk	36.30
in sacks	41.80

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢... $13.75

LAKE SUPERIOR ORES

(51.50% *Fe; natural content, delivered lower lake ports*)

	Per gross ton
Old range, bessemer	$8.70
Old range, nonbessemer	8.55
Mesabi, bessemer	8.45
Mesabi, nonbessemer	8.30
High phosphorus	8.30

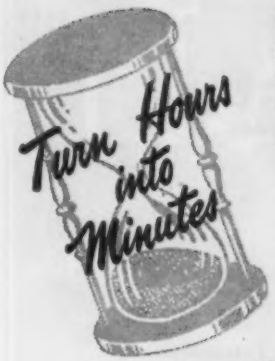
Based on 1951 contracts.

After adjustments for analyses, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

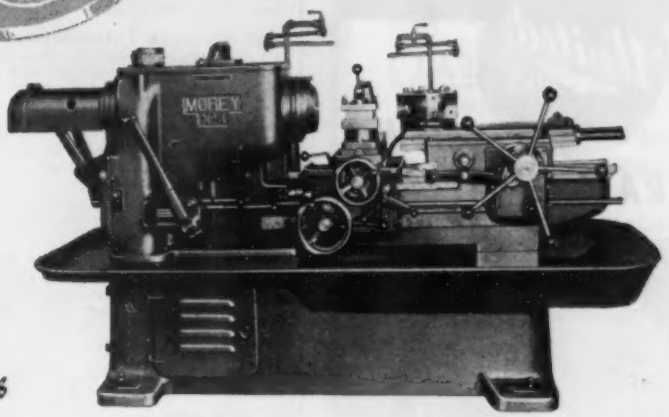
METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f. New York, ocean bags...	7.4¢ to 9.0¢
Canadian sponge iron, del'd, In East	10.00¢
Domestic sponge iron, 98+% Fe, carload lots	15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+% Fe	42.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	53.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe.	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe.	83.0¢ to $1.48
Aluminum	31.5¢
Brass, 10 ton lots	30.00¢ to 33.25¢
Copper, electrolytic	10.75¢ plus metal value
Copper, reduced	10.00¢ plus metal value
Cadmium, 100-199 lb	95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity, del'd	$3.50
Lead	7.5¢ to 12.0¢ plus metal value
Manganese	57.0¢
Molybdenum, 99%	$2.75
Nickel, unannealed	88.0¢
Nickel, annealed	95.0¢
Nickel, spherical, unannealed	92.0¢
Silicon	38.5¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	83.00¢
Stainless steel, 316	$1.10
Tin	14.00¢ plus metal value
Tungstein, 99% (65 mesh)	$6.00
Zinc, 10 ton lots	23.0¢ to 30.5¢



MOREY
TURRET LATHES
No. 2 Plain Type
Nos. 3, 4 and 5 Universal Type



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Infinite variable vibrationless spindle speeds.

Remote speed selection control for speed and ease of operation.

The newly designed MOREY TURRET LATHES take advantage of tungsten carbide tools and incorporate all technical improvements in metals, electronics and hydraulics... our design is not hampered by tradition.

Size	Bar Capacity	Swing	Motor
No. 2 Plain	1" x 6"	14"	3 HP
No. 3 Universal	1⅝" x 10"	16½"	5 HP
No. 4 Universal	2" x 12"	19½"	7½ HP
No. 5 Universal	2½" x 14"	21⅛"	15 HP

FOR BAR and CHUCKING WORK

OBTAIN MAXIMUM PRODUCTION WITH MINIMUM EFFORT FROM MOREY TURRET LATHES . . . INVESTIGATE!

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LABORATORY CERTIFIED ANALYSIS

BRAZING CONDENSER CANS increased production from 100 to 2500 per hour. Courtesy of R.C.A. of Camden, N. J.

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SIL-BOND FOR THE STEELS
MADE IN 3 GRADES . . . 50%, 45%, 35% Silver. Brazes at 1175°F, 1145°F, 1295°F. Tensiles . . . 65 000, 70 000, 60 000 p.s.i. Use with SIL-FLUX. Wire, Rod, Rings, Powder.

PHOSCO FOR THE COPPERS
NO SILVER . . . brazes at 1495°F. Tensile 85 000 p.s.i. Self-Fluxing. Makes joints stronger than parts or metals joined. Approved for Gov't contracts specifying Brazing Alloys costing 3 times as much.

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6% SILVER . . . brazes at 1380°F. Tensile 95 000 p.s.i. Self-Fluxing for Coppers. Use SIL-FLUX for Brasses and Bronzes. Makes joints stronger than the metals it brazes.

BRAZING ALLOYS AND BRAZING FLUXES ARE MADE TO CONFORM TO ALL GOVERNMENT SPECIFICATIONS.

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—Ferroalloy Prices—

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads delivered. (65-72% Cr, 2% max. Si.)

0.06% C	30.50	0.20% C	29.50
0.10% C	30.00	0.50% C	29.25
0.15% C	29.75	1.00% C	29.00
2.00% C			28.75
65-69% Cr, 4-9% C			22.00
62-66% Cr, 4-6% C, 6-9% Si			22.60

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C.	$1.14
0.50% max. C.	1.10
9 to 11% C.	1.08

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

CMSZ

Contract price, cents per lb of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	20.75
Less ton lots	22.00

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50
Less ton lots	17.75

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.00
Ton lots to carload packed	19.00
Less ton lots	20.50

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size.

F.o.b. Niagara Falls, Alloy, W. Va., Ashtabula, O. $185
F.o.b. Johnstown, Pa. $187
F.o.b. Sheridan, Pa. $185
F.o.b. Etna, Clairton, Pa. $188

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.95
Ton lots	12.55

Noted-
for
✓ PRECISION DIMENSIONS
✓ ACCURATE SHAPES
✓ DEPENDABLE FINISH

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COLD FINISHED STEEL
CARBON AND ALLOY

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Newark, N. J. • Putnam, Conn.

Ferroalloy Prices

Continued

Spiegeleisen

Contract prices gross ton; lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$74.00	$75.00
Pgh. or Chicago	75.00	76.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	34.75
Ton lots	36.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.7% max. C, 0.06% P, 90% Mn	26.25	28.10	29.30
0.07% max. C	25.75	27.60	28.80
0.15% max. C	25.25	27.10	28.30
0.30% max. C	24.75	26.60	27.80
0.50% max. C	24.25	26.10	27.30
0.75% max. C 7.00% max. Si	21.25	23.10	24.30

Alsifer, 20%Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.

Carloads	9.90
Ton lots	11.30

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo. $1.15

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn 19.15¢

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	9.90
Ton lots	11.55
Briquet, contract basis carlots, bulk delivered, per lb of briquet	11.15
Ton lots	12.75

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $92.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $90.000. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	21.70
97% Si, 1% Fe	22.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90.95% Si			17.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Turn Page

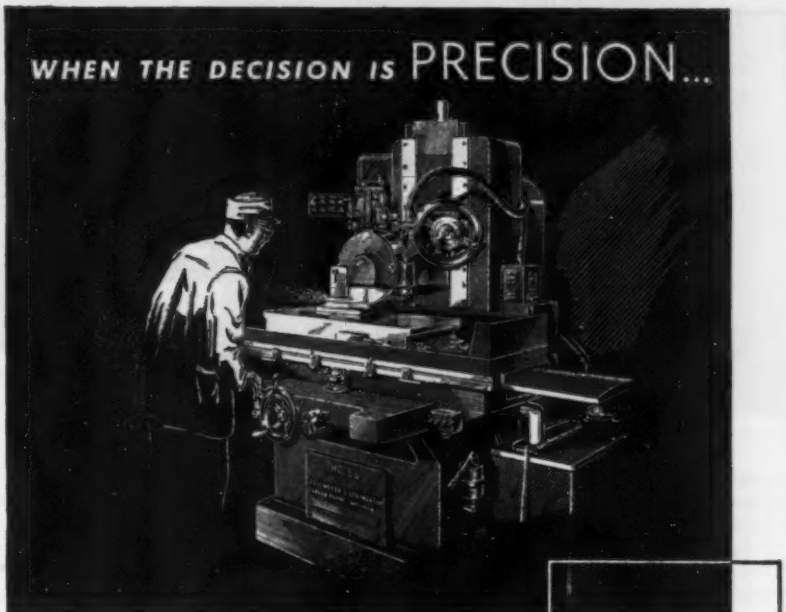
Bolts . . . Nuts . . . Rivets . . . Screws—have provided their users with the same dependable uniform quality and accuracy of finish for almost a Century.

For Greater Security . . .
Fasten Fast with Clark Fasteners

CLARK BROS BOLT CO.
MILLDALE, CONN.

BOLTS • NUTS
RIVETS • SCREWS

6-M-1c



Where extreme tolerances are not required, the choice of any particular grinding machine may not be too important. But, where absolute precision is demanded, the choice is usually *Grand Rapids.*

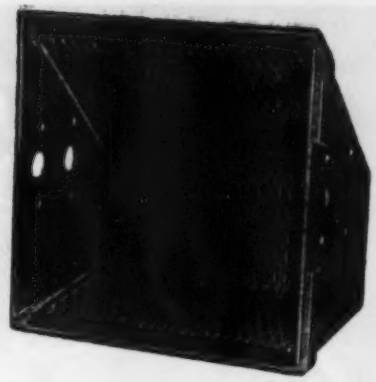
Defense orders make it impossible to fill orders as quickly as we desire—but we know our customers can appreciate the reasons for delay As always we'll do our best to serve you.

GALLMEYER & LIVINGSTON CO.
200 Straight Ave., Grand Rapids, Mich.

Grand Rapids Grinders
—World's finest

GALLMEYER & LIVINGSTON

Typical of Hendrick's Manufacturing Facilities



Hendrick is exceptionally well equipped to manufacture to specifications a wide range of metal products that involve such operations as perforating, shaping, forming, welding, brazing, riveting, etc. The perforated elevator bucket illustrated is typical of the many specialized articles for whose fabrication Hendrick has unusual facilities. Write in detail regarding any metal product you desire fabricated.

SEE OUR CATALOG IN SWEET'S

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Manufacturing Company
37 DUNDAFF STREET, CARBONDALE, PENNA.
Sales Offices In Principal Cities

Perforated Metals
Perforated Metal Screens
Wedge-Slot Screens
Architectural Grilles
Mitco Open Steel Flooring,
Shur-Site Treads, Armorgrids

Handles Loads at Either Side as well as in Front

"EXTREME MANEUVERABILITY IS VALUABLE for getting in and out between closely piled stacks of bars and billets . . . . and for moving bars and billets through low shop doors," *says a letter from Kropp Forge.*

KRANE KAR is used in the Storage Yard for unloading, storage, and for handling heavy forge hammer repair parts, loaded tote boxes, miscellaneous work. *Quoting further,* "Single billets of 15,000 pounds are handled easily. Up to a quarter-million pounds of steel are moved in an 8-hour day with average fuel consumption cost of $1.50."

Only **KRANE KAR** *can perform such difficult Materials-Handling operations ECONOMICALLY . . . . 1*—transports full rated load without stabilizers; 2—tops and lowers boom by power; 3—load is lowered by power; 4—automatic crane braking; 5—unobstructed vision all around; 6—short turning radius; 7—gas-powered **KRANE KAR** works 24 hours a day!

Ask for BULL. #89, entitled "How to Cut Materials-Handling Costs."

1½, 2½, 5 and 10 ton cap.

**The original Swing-Boom Mobile Crane with Front-Wheel Drive and Rear-Wheel Steer.*

SILENT HOIST & CRANE CO. 851 63rd ST., BROOKLYN 20, N.Y.

—Ferroalloy Prices—

Continued

Ferrocolumbium, 50-60%, 2 in. x D, contract basis, delivered, per pound contained Cb.
Ton lots $4.90
Less ton lots 4.95

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $3.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo. $1.41

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
10 tons to less carload $75.00

Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.35

Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots 1.55

Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $177.00

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W,5 ton lots, delivered $5.00

Ferrovanadium, 35-55% contract basis, delivered, per pound, contained V.
Openhearth .....$3.00-$3.10
Crucible 3.10- 3.20
High speed steel (Primos) 3.20- 3.25

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
Carload, bulk lump ..... 14.50¢
Ton lots, bulk lump ..... 15.75¢
Less ton lots, lump ..... 16.25¢

Vanadium Pentoxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.28

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
Ton lots ..... 21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
Carload, bulk ..... 7.00¢

Boron Agents

Borosil, contract prices per lb of alloy, del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B.... $5.25

Bortam, f.o.b. Niagara Falls
Ton lots, per pound ..... 45¢
Less ton lots, per pound.... 50¢

Corbortam, Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.
Ton lots, per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots.... $1.20
F.o.b. Wash., Pa.; 100 lb up
10 to 14% B..... .85
14 to 19% B..... 1.20
19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.
No. 1 ..... $1.00
No. 6 ..... 68¢
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 15-20% B, 5% max. Fe. 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
Ton lots $1.46
Less ton lots 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.
Less ton lots $1.80

Silcaz, contract basis, delivered.
Ton lots ..... 45.00¢

THE CLEVELAND STEEL TOOL CO.

Punches, Dies, Chisels, Rivet Sets

660 E. 82nd St., Cleveland, O.

If it's RIVETED you KNOW it's safe

GOSS and DE LEEUW

MULTIPLE SPINDLE

CHUCKING MACHINES

Four, Five, Six, Eight Spindles • Work and Tool Rotating Type

GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

Cutting Off Machines for Sawing All Kinds of Metals

THE ESPEN-LUCAS MACHINE WORKS

FRONT AND GIRARD AVE., PHILADELPHIA, PENNA.

THE STANDARD OF QUALITY PSA

ALLOY-Tuf (soft) SHOT

BES-tuf (standard) SHOT & GRIT

PHILADELPHIA STEEL ABRASIVE CO.

MODENA, PA. Phone COATESVILLE 2534

OHIO LOCOMOTIVE CRANES

25 TO 50 TON CAPACITY

DIESEL • GASOLINE • ELECTRIC • STEAM

THE OHIO LOCOMOTIVE CRANE CO.

BUCYRUS OHIO

HAYWARD BUCKETS

Use this Electric Motor Clam Shell for rehandling bulk materials in Industrial Plants

THE HAYWARD CO., 40-50 Church St., N. Y.

FORGINGS

Hammered—Upset—Pressed—Extruded—Both Steel and Non-Ferrous Metals. "Large and Small—We Forge Them All" on Hammers from 2000 lbs. to 35,000 lbs. Upsetters from 4" to 9" and Hydraulic and Mechanical Forging Presses. Modern Heat Treating Department.

THE CANTON DROP FORGING & MFG. CO.

CANTON, OHIO

"I SAW IT IN THE IRON AGE,"

is a common phrase in the metalworking industry. Let the industry say it about your product.

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PEENING

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SAN CARLOS . . . . . CALIFORNIA

PORT HOPE . . . ONTARIO, CANADA

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Seamless Steel Tubing...

ELLWOOD IVINS

1¼" O.D. and smaller

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700 Valley Road, Phila 25, Pa

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PERFORATIONS IN

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BOX 28 WYOMING, PA.

WRITE FOR CATALOG 35

CONSIDER GOOD USED EQUIPMENT FIRST

AIR COMPRESSORS
Ingersoll Rand 33" x 20½" x 24" Complete with 635 H.P. G. E. Syn. Motor 2300/3/60.
2873 cu. ft. Worthington 29" x 21" x 18½" x 21". Complete with Elec. Equipment.

BELT GRINDING UNIT
Hill Clutch & Machine & Fdry. Co. Open Side Abrasive Belt Grinding Unit, Designed to accommodate slabs up to ⅜" thick x 30" wide x 30' long.

BENDING ROLL
No. 6 Hilles & Jones Pyramid Type Plate Bending Roll, Capacity 16' x ¾" Plate Complete with Electrical Equipment.

BULLDOZER
#9 William White Bulldozer, Motor Driven with 50 H.P. Motor. 440 v. 3 ph. 60 cycle. Face of Crosshead 20" x 90", Movement of Crosshead 24".

CRANE
5 ton Shaw 70' Span, Three 230 Volt D. C. Motors Equipt for Magnet Operation, without Magnet.

DIE CASTING MACHINE
Model BA-12 KUX Die Casting Machine, Air Operated, Plunger Gooseneck Type for zinc, lead and tin. Die space between bars 12¼" x 12¼", Die Separates 8". NEW 1949, never used.

FLANGING MACHINES
¾" McCabe Pneumatic Flanging Machine, Pneumatic Holddowns, Circle Flanging Attachment and numerous dies.
No. 3 Blue Valley Flanging Machine. Will flange flat heads from 48" to 10' or 12' dia. Silent chain drive with A.C. Motor. Equipped with air cylinder and hydraulic pump.

FURNACES—MELTING
400 lb. Moore Type "UT" Melting Furnace Top Charge. Complete with Transformer. New 1943—Little Used.
15 ton Heroult Model V-12 Electric Melting Furnace Top Charge hydraulically operated. Complete with Transformer Equipment.
25 ton Moore Size "NT" Melting Furnace, with 7500 KVA Transformer 13,200 vo. 3 ph. 60 cy.

GEAR REDUCER
600 H.P. Farrell Birmingham Herringbone Gear Unit. R.P.M. 7.20 to 74.54 NEW.

HAMMER
10,000 lb. Chambersburg Steam Drop Hammer.

PLANERS
48" x 48" x 20' Cincinnati, Four Head
48" x 48" x 12' Niles-Bement-Pond, Four Head
60" x 60" x 12' Niles-Bement-Pond, Four Head
72" x 72" x 12' Niles-Bement-Pond, Four Head

PLATING MACHINE
Type "B" Crown Full Automatic Nickel & Chrome Plating Machine, Max. Work Size 16" wide x 36" deep x 4" thick.

PRESS—KNUCKLE JOINT
1000 ton Bliss #27 Knuckle Joint, Embossing & Coining Press, 2½" Stroke, 18" Shut Height.

ROLLING MILLS
8" x 10" Schmitz Single Stand Two High With Friction Drive Rewinder.
12½" x 16" Philadelphia Two High Cold Rolling Mill. Complete with Pinion Stand, 75 H.P. Motor 440/3/60. Starter and Controls, Incl. Coiler.
18" x 24" Waterbury Farrel Two Stand Two High Rolling Mill, Complete with Elec. Equip.

STRAIGHTENER
¾" Shuster Straightening & Cut-Off Machine 30' Cut-Off, Complete with 15 H.P. A.C. Motor.

TESTING MACHINES
300,000 lb. SOUTHWARK-EMERY Universal Hydraulic Testing Machine.
100,000 lb. Olsen Universal Hydraulic Testing Machine. Three Dial Type

TRIMMING LINE
#1049 Torrington Trimming Line, With Feed Rolls and Scrap Cutter. Capacity for steel or aluminum alloys ⅛" max. Trimmed width 22" min. 66" max. Scrap Length ¾" min. 2¼" max.

WELDERS
700 KVA Federal Flash Welder, Enclosed Rim Type, 440 Volt, Single Phase, Ring Sizes 6" to 35" Diameter x 12" Wide.
40 KVA Sciaky, Spot Welder, 36" Throat 440/3/60 operation.

RITTERBUSH & COMPANY, INC.
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Phone—Cort 7-3437

The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Convention Notes — Three to four hundred machinery dealers and friends are expected to attend the eleventh annual Machinery Dealers National Assn. Convention at the Waldorf-Astoria Hotel, New York, May 8-10.

After an opening address by MDNA President Joe Weiss, Tell Berna, general manager of the National Machine Tool Builders Assn., was scheduled to give a detailed analysis of the overall machine tool field picture.

The knotty problem of price control regulations was to be handled by OPS representative Ralph Irwin, while the recently issued rulings of the Renegotiation Board were to be clarified by Board Chairman, H. M. Smoot. The subject of machine tools, domestic and imported, was to be covered by IRON AGE's George Sullivan.

Up to convention time there were no new developments on the amendment to CPR 80.

Oil Tank Output—Cadillac Tank Plant in Cleveland, now turning out Walker Bulldog tanks, is one of the best examples of how used machinery enabled a war plant to get into production much earlier than if it had waited for new machine deliveries.

Cadillac's sources include innumerable used machinery outlets and 41 government arsenals. When a needed piece of equipment is located, highly skilled and experienced Cadillac personnel go over the machine thoroughly to determine whether it will suit their operation. These men have traveled all over the country to pick up needed equipment. So far about 560 used and government-owned machines have entered the plant.

Bottleneck Looms — When first getting into production a shortage of large vertical and horizontal boring mills threatened to be a bottleneck. The Betts 24-ft boring mill is a good example of how Cadillac ingenuity prevented a slow-up.

Studies of production tool requirements showed that two boring mills large enough to swing a tank hull on the table of each machine would be needed for the tank plant production lines. These mills are designed to grind and turn the surface on the tank hull which supports the turret. A machine large enough to perform the operation required 18 months to build. This length of time was out of the question.

Ingenious Solution — Cadillac and Betts engineers got together to solve the problem. Since boring mills with 12-ft beds were available, the engineers worked out a way of extending the side columns of a 12-ft mill, to obtain a "swing clearance" of 24 ft. The effective working radius of the machine was doubled without the expense and time needed to build a machine twice the size. Usefulness of the machine was doubled by adapting a grinding head to be used in conjunction with the machining tools.

The first giant machine which took only five-and-a-half months to build cost only half as much as a new 24-ft machine. This figure includes the cost of adapting the machine for grinding.

Close Tolerance—Despite their great size, tolerances of 0.001 in. can be held over a large area such as the ball race surface of the Walker Bulldog. Since then, a second mill has been installed at a comparable saving in time and money. Both machines weigh 114 tons each and stand over 17 ft high.

When a used machine arrives at the Cadillac Tank Plant it is inspected, photographed, tagged and an estimate of the repair costs is made. It is washed with a noncaustic solvent and steam-cleaned with a pressure spray. Then the machine is broken down and reassembled, replacing whatever parts are needed. It is then tested and finally turned over to the production department.